

JAN 28 19

Medical Lib.

Volume XXII. No. 1

JANUARY, 1931

Canadian Public Health Journal

Devoted to the Practice of
PREVENTIVE MEDICINE

The Control of Gonorrhoea in Women

W. W. LAILEY

**Amentia---An Economic, Educational, Social and
Public Health Problem**

B. T. McGHIE

**A Comparison of Lactose Broth and Lactose
Bile as Enrichment Media**

A. G. LOCHHEAD AND D. G. HEWER

What is a Stillbirth?

E. GAGNON

**The Public Health Nurse in the Control of
Tuberculosis**

R. E. WODEHOUSE

Interpretation of Reactions following Revaccination

N. E. MCKINNON AND R. D. DEFRIES

Published by the

CANADIAN PUBLIC HEALTH ASSOCIATION

Editorial and Business Offices:

40 ELM STREET, TORONTO 2

CONTROL-



Part of the Navy's "High Hat" Squadron
coming into formation,
under perfect control, after the take-off.

is essential to successful CHLORINATION

"INADEQUATE control over purification methods was responsible for twenty per cent of all water borne diseases during the decade 1920 to 1929" (so discloses the investigation of Wolman and Gorman as reported to the recent meeting of the American Public Health Association) . . . Eighteen thousand cases of typhoid and dysentery could have been prevented with adequate chlorination...W&T Vacuum chlorinators positively control chlorination.

Their dependability is proven by the records of over three thousand machines now in daily service . . . Installed more than eight years ago the first Vacuum chlorinator is still giving excellent service. Maintenance cost has been less than 1% per year.

NO VACUUM CHLORINATOR HAS EVER WORN OUT
Ask for Technical Publication No. 38

A Product of
WALLACE & TIERNAN LTD.

Manufacturers of Chlorine Control Apparatus

32 Front Street West, Toronto
813 Royal Bank Bldg.
Main and William Street, Winnipeg
216 New Birs Bldg.
Montreal, P. Q.

"The only safe water  is a sterilized water"

© 1930

85





CANADIAN PUBLIC HEALTH JOURNAL

Vol. XXII

January 1931

No. 1

The Control of Gonorrhoea in Women*

W. W. LAILEY, M.D., F.A.C.S.

Senior Demonstrator in Obstetrics and Gynecology, University of Toronto

THE control of gonorrhoea is a problem much more comprehensive and more difficult than just the medical treatment of women who have contracted the disease. Its infectious nature, its widespread prevalence, its association with prostitution and immorality, the fact that it is a potent cause of sterility and the stubbornness with which it resists treatment, all these facts have aroused the medical profession, the social service, and the state, to co-operate in an endeavour to first urge those who have the disease to receive adequate treatment, and secondly, to prevent more infections by a system of sex education and hygiene.

Gonorrhoea in the female presents an even more difficult problem than in the male because it is often harder to diagnose and women are slow in undergoing an examination. In a recent survey¹ on venereal diseases in Toronto conducted by a committee of the Academy of Medicine, Toronto, and the Social Hygiene Council it was found that practically twice as many men were under treatment for gonorrhoea as women. This ratio probably means that the men are more largely reporting for treatment, while the women in large numbers are not.

One of the disappointing features in the past has been that, while the best available treatment has been placed within their reach, so many women have not availed themselves of the privilege for one reason or another, or, if they have, they have become weary in well-doing and have abandoned the treatment when only half cured. It is in such situations that the social service nurse takes hold, and it is generally agreed that she has become indispensable in the campaign against venereal diseases. These nurses perform not only the follow-up work of the clinics, but in doing this they enter the homes or boarding houses and there learn of others who need treatment. Further, they teach the patient how to keep from spreading the infection. The advance that will probably be made in the near future in the successful control of venereal diseases will be in extension of the work of the social service nurses through increased co-operation with doctors and clinics, rather than by the further discovery of specific remedies.

*Presented at the Academy of Medicine, Toronto, November, 1930.

DIAGNOSIS

As before mentioned, women usually do not appear for examination or they wait until the disease has become chronic when it is much harder to diagnose. There are three locations in which the disease begins and flourishes. All three contain columnar epithelium. Skene's tubules opening on the floor of the urethra, Bartholin glands and the cervical canal with its glands. Ordinary leucorrhæal discharges further obscure the diagnosis. One negative smear, or many, does not preclude the chance that a Neisserian infection is present. It is better to have a suspicious case attend for examination and treatment even at the risk of a mistaken diagnosis than allow this same case to run the chance of spreading the disease.

The complement fixation test for gonorrhœa is of considerable help in doubtful cases. At St. Thomas' Hospital, London, this test has been in routine use for nine years, and has proved to be very reliable.² T. E. Osmond has reported 5,000 cases.³ In these only 0.6 per cent showed false positive results, a very low percentage. A positive result is almost diagnostic in any stage of the disease. A negative result is of similar significance to a negative Wasserman reaction. In gonorrhœa with complications the test is almost 100 per cent positive. With such an aid to diagnosis it is surprising that so little use is made of the test in this country.

TREATMENT

1. *Acute*—There is general agreement among those engaged in the treatment of this infection amongst women that active local measures should not be undertaken. The aim in the first ten days or two weeks of the onset is to keep the patient in bed in a modified Fowler's position. Hot boracic compresses to the vulva are helpful, and if urethral involvement is found a sedative and alkaline mixture by mouth is indicated.

When the subacute stage is reached, usually at the end of ten days, the patient is allowed to leave the bed and is directed to take douches twice daily. Also a local application of a 20 per cent solution of silver nitrate or some other antiseptic is made to the cervical canal. The urethritis in the female fortunately does not persist and is usually better not treated at this time.

2. *Chronic*—After four or five weeks the condition becomes chronic. This is usually the stage at which the patient makes her first visit. To even outline the different treatments undertaken for the cure of chronic gonorrhœa in the female would be an endurance test, and the result largely fruitless. When there are so many methods of treatment advocated, the presumption is natural that none are entirely satisfactory, and such is the situation. The greatest number of those who can claim considerable experience advocate still daily or twice daily douches with local application to the affected parts once or twice

weekly. One of the silver preparations is probably the most effectual in the destruction of the gonococcus, yet the different dyes such as methylene blue; acriflavine; mercurochrome, etc., have their advocates.

One of the greatest helps used in recent years to clear up chronic Neisserian infection of the cervix is the cautery. The cautery can be used as a means of completely destroying the gland bearing area of the cervix at a single cauterization. This will require a general anesthetic. Radial linear cauterization may be undertaken without an anesthetic.

Diathermy which theoretically should be an ideal method of destroying the organisms by heat generated deep in the tissues has been disappointing in our experience.

Whatever method is used, thoroughness and persistence on the part of the doctor who administers the treatment, and the co-operation of the patient by being regular in attendance, are essential. The douches taken at the patient's home are helpful if they are taken according to instructions. The recumbent position with the hips elevated and a sufficient quantity (about two quarts) of whatever solution is advised, are necessary if full benefit is to be derived from douching.

PELVIC GONORRHOEA

When the gonococci pass through the barrier at the internal os and along the endometrium to the tubes, pelvic gonorrhoea, varying in severity from a catarrhal to a purulent inflammation, is set up. This extension of the infection is followed by a train of symptoms now so well known that they need no emphasis. The best treatment in acute salpingitis, however, does not include surgical interference and removal of the tubes, as one would remove an inflamed vermiform appendix, but rather palliative measures and the allowing time for the infected area to be isolated from the abdominal cavity, and for the restoration of the tubes. It is amazing what rest and time will do for these patients. What were formerly looked upon as "re-lighting up" of a previous pelvic inflammation are now considered cases of a new pelvic gonorrhoeal infection. Therefore, attention should be given to clearing up the lower genital infection instead of removing the adnexae.⁴ Curtis⁵ writes that "eighty-five per cent of patients who come to us with acute salpingitis progress to a clinical cure without operation. Surgery is ultimately resorted to in approximately fifteen per cent of these cases, chiefly for relief from the sequelae of salpingitis; operations are directed to the reconstruction of tissues laid waste by disease rather than to removal of organs for the purpose of stamping out infection."

A subtotal hysterectomy with the leaving of as much ovarian tissue as possible or pan hysterectomy when the cervix is badly infected is generally the most satisfactory when operation is performed. Obviously a large pus tube may need drainage just as does any abscess.

The question is frequently asked when can a patient be pronounced

cured? Ricord has said, "we all know when gonorrhoea begins but the Lord knows when it ends." In spite of this uncertainty some standard of cure is practically necessary. When there is an absence of purulent discharge from the urethra and cervix, when Skene's tubules and Bartholin glands are free of infection, and when at least three consecutive negative smears have been taken from the urethra and from the cervix over a period of three months, then it is said these patients are cured. When marriage is contemplated a further delay of several months is advisable.

Another question that arises in our minds, in connection with the control of venereal disease, is this. Has all this effort through these past years resulted in any real lessening of these infections? There does not appear to be much in medical publications to afford an answer, but available figures answer in the affirmative. There has been progress in the right direction. W. F. Snow⁶ in an article published in *Hospital Social Service*, New York, demonstrates by diagrams the decrease of venereal diseases in the American Army and Navy from a peak in 1912 to the year 1928. The Navy has 190 cases per thousand in first mentioned year, 1912, and 120 per thousand in 1928. The Army figures declined from 180 to 60 during the same years, a two-third reduction. J. S. Grove⁷, Chicago, published his experiences after working in various European venereal disease clinics. He stated as an interesting sidelight that this work was largely performed by dermatologists instead of urologists and gynecologists. All of these clinics emphasized the marked decrease in the number of patients.

The records at the Special Treatment Clinic⁸ of the Toronto General Hospital show that in 1922 there were 793 patients under treatment for venereal diseases, 84 of these being women with gonococcal infection; in 1929, there were 1,071 in all, with 44 women treated for gonorrhoea. While in the first 10 months of 1930, 1,231 is the total number with a considerable increase in women who had gonorrhoea.

From this we might conclude that venereal diseases are on the increase in this part of the world. But to take a more hopeful view, the increase may mean only that more efficient ways and means are being used to bring such to the clinics. The spread of sex education; the efforts of the social service; and the authority given by the Venereal Disease Act of 1927 are probably all contributing to the final control of the venereal diseases.

REFERENCES

- 1Fenwick, C. P. Venereal diseases survey in Toronto, *Canadian Public Health Journal*, Vol. XXI, No. 3, March, 1930, pp. 132-138.
- 2Price, N. Owood. The gonococcal complement fixation test: improvements in technique, *Journal of Pathology and Bacteriology*, London, April, 1930, pp. 493-495.
- 3Osmond, T. E. and Oliver, J. O. Value of complement fixation test in gonorrhoea; study of 5,000 tests, *Br. J. Ven. Dis.*, No. 5, October, 1930, pp. 281-301.
- 4Gordon, C. A. Practical points in management of gonorrhoea in women, *Am. Jour. of Surgery*: 8, February, 1930, pp. 304-307.
- 5Curtis, A. H. Gonococcal lesions of female genitalia including consideration of some important closely allied problems, *Am. Journ. of Obstet. & Gynecology*: 16, October, 1928, pp. 531-535.
- 6Snow, W. F. Social significance of venereal diseases, *Hospital Social Service*, 21, March, 1930, pp. 185-191.
- 7Grove, J. S. Treatment of gonorrhoea in some European clinics, Vol. 54, November, 1928, pp. 381-384.
- 8Dept. of Social Service, Out-Patient Dept., Toronto General Hospital, Toronto, 1930.

Amentia—an Economic, Educational Social and Public Health Problem*

B. T. McGHIE, M.D.

Director of Hospitals and Sanatoria, Department of Health, Ontario

AMENTIA is usually defined as absence of the intellect, but for the purposes of this paper I prefer to interpret it in a broader sense, as referring to that particular class of persons who are intellectually incapable of receiving education along conventional lines, this latter interpretation being more in accord with the present day conception of the problem under discussion.

ECONOMIC

The first attempt in this Province to deal with amentia as a separate problem was in 1876, when Dr. A. H. Beaton was appointed Medical Superintendent of an institution located in the town of Orillia, within a stone's throw of the present site of the Champlain Monument. In 1891 the present institution was completed and occupied. The records as from the opening of the institution have been reviewed in obtaining the figures herein presented.

There have been, since 1876, a total of 4559 admissions to the institution.

Those remaining until their death showed an average length of residence each of 9 years and 2 months. The cost for the maintenance and care of these patients at the average cost per day to the institution was approximately four and one-half million dollars.

The patients discharged from the institution showed an average length of residence each of 5 years and 8 months, at a cost to the Government of \$1,350,000.

There remain in the institution at present 1398 patients, whose average length of residence has been approximately five years each. These cases have already then cost the Government over 2½ million dollars, and continue to necessitate an expenditure of \$1 per day each, or a total of \$1,398 per day.

The capital expenditure for the present plant is at least two million; figures are not available as to the amount expended on the former institution.

So that, since 1876, mentally deficient persons under government supervision have cost the Province of Ontario the sum of approximately

*Presented at the General Sessions, Annual Meeting Canadian Public Health Association and Ontario Health Officers' Association, Toronto, May 20th, 1930.

eight millions of dollars, money actually spent on their behalf, to say nothing of the loss to the Province as a result of the fact that 4,500 citizens were financially non-productive.

It was estimated in the United States in 1923 that only 8 per cent of the mentally retarded in the community received institutional care. Taking it for granted that the same rate applies in this Province, there have been, since 1876, a total of 56,975 mentally deficient persons in Ontario.

If one could be sure that the 92 per cent remaining in the community had not been a drain on the resources of the Province, the outlay of some 8 million dollars over the past 54 years would not concern us greatly, but it is doubtful if the problem, from the economic viewpoint, can be thus lightly dismissed. If one were able to check up on the expenditures of the various social welfare organizations, the cost of homes, shelters, orphanages, etc., housing that section of our population, I venture to say the figures would be alarming, to say nothing of the cost for repeated trials and incarceration of recidivists appearing in our courts and returning again and again to our penal institutions. One would not presume to say that all such repeaters are mentally defective, but one has but to walk through a penal institution to pick out large numbers of the type to which we refer.

Taking all these factors into consideration, the financial outlay in treating and caring for mental defectives in this province has been enormous, and the economic problem is worthy of note.

EDUCATIONAL

You are all probably more or less familiar with the history of the treatment of this type of case in the early days, when all such persons were considered as savages, possessed with devils, etc., and were the victims of scorn and ill-treatment. Then institutions were provided for their care, and known as "Asylums for Idiots". It was not until Itard, a great student and research worker, began to devise new methods of training a wild, mentally defective boy found in the woods of Aveyron, France, that a humanitarian outlook was adopted. Shortly afterwards Seguin and Montessori began their work in sense-training classes. Later such workers as Fernald, Goddard, and others, through research and experimentation with many types of training, made it possible to classify these unfortunate cases along the lines of the educational possibilities latent in each.

Thus it was in the psychological-educational field that real progress was first made in discovering the extent and dealing with this problem of mental defect. As a result, our institutions have now no justification in remaining "asylums" but should in actual fact be schools in which every child requiring institutional care can be taught useful information according to his or her intellectual capacity.

The early classification divided these people into two groups in order of ability, *i.e.*, idiots and imbeciles, but in 1910 Goddard, having applied the Binet-Simon tests in his studies in America, discovered that just as in this room no two people have exactly the same intellectual endowment, so in the field of amentia there were many individuals who, while above the upper level of the imbecile group, were yet mentally below the so-called "normal" standard of intelligence, and to this group he gave the name "moron" from the Greek word meaning foolish.

The large proportion of these border-line subnormals found in the community at once placed into discard the former policy of institutionalizing all defectives, and turned the thoughts of educationists into new channels. The age of the "dunce cap" passed as we began to understand this problem of mental defect, and this change in concept has even now reached the point where it may benefit the normal child, as educational leaders are seriously considering the advisability of a more elastic type of curriculum for children under the age of 16, so that the course will be enriched with manual and pre-vocational subjects in cases where it is quite evident that the child is not academically inclined.

So far as the education of the mentally retarded is concerned, rather than completely disregarding the child as being unable to progress at all, the viewpoint has changed to that of believing every child to be trainable to some degree. In the field of amentia, therefore, our problem would appear to be to find out the degree to which a child is educable, and then to provide methods and means of instruction to develop whatever ability may exist, whether the child be in the institution, in the public school, or in the home. A program, which will in some measure accomplish this, will make the individuals concerned happier, and in some cases, enable the boy or girl to become in a measure self-supporting, thus materially lessening the economic burden to the Province.

SOCIAL

As stated previously, in the 1923 survey in the United States it was discovered that less than 8 per cent of the mentally defective population were cared for in institutions. At that time, a survey of the institutional accommodation showed from as high as 88.1 beds per 100,000 of the population in New York State, down to 0 in other States, with an average of 39.3 beds per 100,000 population. At present we have in Ontario a ratio of 46.6 beds per 100,000 of the population. This year another half million dollars is being spent for additional accommodation, but, even though the Government continues to build indefinitely, the greater percentage of the mentally retarded must remain

in the community. The States to the South that have the largest building program still have long waiting lists of applicants.

Primarily it is the responsibility of the community as to what shall be done with these cases. The ideal solution of course would be institutionalization, but this type of treatment is, from the point of view of the State, economically and therefore numerically impossible. The greatest problem then from the social point of view would seem to be: How shall the community deal with these cases which must of necessity remain therein?

One would say that if we are to be humanitarian in our treatment, we must understand these people, and if we are to understand them we must first know them. By knowing the individual cases we will know the extent of the whole problem. Mental defectives are easily influenced. They are therefore bound to fail in a poor environment, and give very little trouble in a favorable environment. They are, therefore, an index of social conditions. A retarded child, having been given an opportunity at an early age to obtain that type of education most suitable to meet his needs has the right to expect an attitude on the part of the community that will enable him to establish himself as a useful citizen, and if we find a community with large numbers of delinquent, socially menacing feeble-minded in its midst, we may well ask, "what kind of community have we here; what kind of homes, schools, neighborhoods, recreation, etc.?"

Briefly then, the social problem, or in other words the problem of the community, would seem to be to provide for the necessary training and socializing of the retarded individual, and, having made this provision (through home and parents, social agencies, institutions, etc.) to educate the so-called "normal" members of the social group to adopt a helpful and understanding attitude which will enable the retarded members to take their place in society and be reasonably happy.

PUBLIC HEALTH

In considering the field of amentia from a public health standpoint, one has but to study the etiology of the condition in cases resident in our institution. A study was made of 903 cases where the etiology was known. From this study it was learned that 221 cases, or 24.5 per cent were defective because of some pathological condition, such as birth injury, post-febrile conditions, endocrine disturbances, faulty developmental conditions, mal-nutrition, epilepsy, etc. In addition, there were some 497 cases where the etiology was unknown, or at least not proven. These figures surely issue a challenge to the profession to study the problem from a medical research standpoint. It is within the memory of all of us that whole wards in our institutions were crowded with bed-ridden cases of general paresis, considered hopeless

and unavoidable, whereas to-day, due to persistent medical research, no such cases are to be found. Is it not then conceivable that much can yet be done to prevent birth injury, the spread of whooping cough, scarlet fever, measles, etc., among children within the first few months of life when most damage is done to the central nervous system? May it not also be true that cases of glandular disturbance, recognized earlier and given medication, may be saved the handicap of a blighted intellect?

From the health point of view, one must again consider the menace to the general health of a community, of neglected families of low mentality, who, without proper instruction and almost continuous supervision, will not adopt the hygienic measures which, through the efforts of the members of this Association, have become second nature to the people of this Province. For such cases, one might well hope for some type of wardship which can be recommended by the medical officer of health to insure proper supervision and instruction. It is interesting to note that since the inauguration of a definite policy of public health along the lines of preventive medicine, the percentage of admissions to our institution whose condition was acquired as a result of pathological conditions, has been cut approximately in half.

Physical health has in the past perhaps been the major consideration of public health associations and allied organizations. The time has arrived, however, when the problem of mental health is receiving universal consideration as being as integral a part of the social order as is physical health. In fact, the two have been found to be so closely interwoven as to make treatment of them as separate entities practically impossible.

CONCLUSION

In very truth then, amentia is an economic, educational, social and public health problem, all phases, however, resolving themselves into a problem of public health. You, as medical men and members of this Association, have had no hesitation in availing yourselves of every facility provided for the benefit of mankind from the standpoint of physical education and treatment. May I make an appeal to you to avail yourselves also of the assistance given by psychiatrists, psychologists and other workers in the field of amentia, in order that the general well-being of the social order at large may be furthered in every possible manner.

A Comparison of Lactose Broth and Lactose Bile as Enrichment Media for the Detection of Pollution in Farm Well Waters

A. G. LOCHHEAD AND D. G. HEWER

*Division of Bacteriology, Central Experimental Farm,
Ottawa, Ontario*

INTRODUCTION

ALTHOUGH most bacteriologists on this continent are agreed that examination of water for the presence of coliform organisms serves as the best means of detecting pollution, there is considerable divergence of opinion as to whether the search for coliform organisms should be restricted to a detection of the presence of members of the *coli-aerogenes* group or extended to determine whether the water contains so-called "fecal *B. coli*." In the Standard Methods of the American Public Health Association¹ the search for organisms indicative of pollution is confined to a demonstration of the presence of gram-negative, non-spore forming, aerobic bacilli capable of fermenting lactose with the production of gas, or in other words, members of the *coli-aerogenes* group.

Of late years an increasingly convincing array of evidence has been accumulated tending to show that *Bacterium aerogenes* is not to be considered as an index of fecal pollution, and that consequently a differentiation between this organism and *Bacterium coli* is essential for the best interpretation of the results of a water analysis. While both organisms agree with the above definition of the American Public Health Association, yet they differ in certain physiological characteristics which appear to justify specific distinction. *Bacterium aerogenes* ferments lactose with a higher ratio of CO₂ to H, produces acetyl-methyl carbinol, a lower hydrogen-ion concentration in the methyl-red test, is able to utilize citrates as sole source of carbon and uric acid as sole source of nitrogen. Moreover, studies in the correlation of the characteristics of organisms isolated from feces show that in but rare instances has *Bact. aerogenes* been isolated, *Bact. coli* being almost invariably the type found. In addition to the data summarized by Levine⁶ regarding the incidence of these organisms in feces, may be added more recent evidence from the studies reported by Schöbl and Ramirez⁸, Hicks⁵, and Brown and Skinner⁴, which supports the view that *Bact. aerogenes* is essentially a non-fecal organism. This organism

is normally present in considerable numbers in soil, on plants and in other non-fecal sources from which it may conceivably enter water, and its presence in the latter would obviously not have the same sanitary significance as that of *Bact. coli*, the type associated with feces.

For the detection of organisms of the coli-aerogenes group in water preliminary enrichment in a liquid medium containing lactose is usually carried out on definite portions of the water under examination. For this purpose "Standard Methods" prescribes a lactose broth containing 0.5 per cent sugar. The employment of ox bile or bile salts in addition to lactose has been extensively studied; in fact, lactose-peptone-bile was adopted for a time by the American Public Health Association, to be superseded in 1917 by lactose broth for use in the standard presumptive test. Bile media, being selective, have the advantage of inhibiting many organisms outside of the coli-typhoid group, but in the hands of some workers were found to exert likewise an inhibiting action upon even members of this group, and for this reason did not find universal favour. As pointed out by Prescott and Winslow⁷, however, much of the confusion in regard to the value of bile enrichment media is doubtless due to varying amounts of bile used by various investigators. Levine⁸, in summing up the merits of lactose broth and lactose bile, believes that bile furnishes a more reliable presumptive test, *i.e.* gives a higher proportion of confirmed tests than lactose broth, but that the latter permits of the detection of a greater proportion of the colon group, and thus in a given number of samples will give a higher total number of positive results. Doubtless partly for this reason the standard method requires lactose broth where the indication of pollution is the presence of members of the coli-aerogenes group.

EXPERIMENTAL

In this laboratory samples of farm well waters are being constantly received for analysis. In view of the different sanitary significance of the presence of *Bact. coli* and *Bact. aerogenes* in a sample of water, it is evident that reports and recommendations based on the detection of members of the coli-aerogenes group without distinction between fecal and non-fecal types may cause unnecessarily severe criticism of certain waters. Accordingly, in confirming a presumptive test for members of the coli-aerogenes group, it is considered important to differentiate between *Bact. coli* and *Bact. aerogenes*. In judging a sample, the presence of the latter is not ignored, but regarded as having a different significance from the presence of *Bact. coli*, plate counts at 37° and 20°C. being also taken into consideration.

The object of the work here reported was to note the relative value of lactose broth and lactose bile as presumptive tests, not only for members of the coli-aerogenes group, but for *Bact. coli* proper. From each sample of water two 10 cc. portions, two 1 cc. portions and one

0.1 cc. portion were measured into fermentation tubes containing lactose broth and lactose bile respectively. The media were prepared from the desiccated products of the Digestive Ferments Company, the lactose broth (0.5% sugar) conforming to the "Standard Methods" formula, while the lactose bile contained, per litre, 10 gr. peptone, 10 gr. lactose and 50 gr. desiccated ox bile. Tubes were incubated at 37°C. and gas production noted after 24 and 48 hours respectively, distinction being made between the formation of gas occupying more or less than 10 per cent. of the inverted vial.

From the tubes of lactose broth and lactose bile respectively, which showed gas formation with the smallest quantity of water, confirmatory tests were made by transfers to plates of Levine's eosin methylene blue agar (Difco). After 24 hours' incubation (or 48 hours if necessary), transfers were made to nutrient agar slants from two isolated colonies considered to be most likely organisms of the coli-aerogenes group, preference being given to those considered to be of fecal type, for which purpose eosin methylene blue agar lends itself with a fairly high degree of accuracy⁶. The cultures thus obtained were further examined, according to regular methods, for lactose and saccharose fermentation, reaction to the Voges-Proskauer and methyl-red tests, gelatin liquefaction, indol production, motility, reaction to the Gram stain, and appearance on fresh slants of eosin methylene blue agar. Gram-negative, non-liquefying, lactose fermenting rods were considered members of the coli-aerogenes group, while those which, in addition, gave a positive methyl-red test, a negative Voges-Proskauer reaction and showed black, usually with a more or less pronounced metallic sheen, on eosin methylene blue agar were considered as *Bact. coli*. In studies in which characteristics of coli-aerogenes bacteria have been correlated with their origin, various workers^(4 5 8) have shown the value of the methyl-red and Voges-Proskauer tests in distinguishing between types of fecal and non-fecal origin. Indol production, on the other hand, though considered by many workers, particularly in Europe, as essential in the diagnosis of *Bact. coli*, has been found to correlate less accurately with the known origin of coli-aerogenes bacteria, as shown by the studies of Chen and Rettger⁴, while Bardsley² states that failure to produce indol is hardly sufficient basis for the exclusion of an otherwise typical bacillus from the *Bact. coli* group.

In Table 1 is presented a summary of the presumptive tests for coliform bacteria, obtained with lactose broth and lactose bile respectively. In it are recorded the numbers of tubes of each medium showing gas production in the case of 482 samples of farm well waters showing fermentation in one or more of the tubes made. It will be observed that of 2,410 tubes of each medium, lactose broth gave a total of 1,263 and lactose bile a total of 1,199 of presumptive or doubtful tests for the presence of organisms of the coli-aerogenes group.

TABLE 1

GAS FORMATION IN LACTOSE BROTH AND LACTOSE BILE TUBES FROM 482 SAMPLES OF FARM WELL WATERS

Quantity of water	No. of tubes of each medium	Lactose broth			Lactose bile		
		10% gas in 24 hrs.	less than 10% gas in 24,10% in 48 hrs.	less than 10% gas in 48 hrs.	10% gas in 24 hrs.	less than 10% gas in 24,10% in 48 hrs.	less than 10% gas in 48 hrs.
10 cc.....	964	416	110	117	413	104	76
1 cc.....	964	308	88	81	300	83	70
0.1 cc.....	482	88	24	31	89	38	26
Total.....	2,410	812	222	229	802	225	172

The results of the confirmatory tests made on the tubes of each medium showing gas with the smallest quantity of water are given in Table 2, which shows respectively the cases in which organisms of the coli-aerogenes group and *Bact. coli* have been isolated.

TABLE 2

CONFIRMATORY TESTS FROM LACTOSE BROTH AND LACTOSE BILE TUBES FOR COLI-AEROGENES ORGANISMS AND BACT. COLI (FECAL TYPE)

	Lactose broth			Lactose bile		
	10% gas in 24 hrs.	less than 10% gas in 24,10% in 48 hrs.	less than 10% gas in 48 hrs.	10% gas in 24 hrs.	less than 10% gas in 24,10% in 48 hrs.	less than 10% gas in 48 hrs.
Tubes examined.....	175	114	71	175	98	48
Coli-aerogenes found.....	165	68	19	170	67	8
Per cent.....	94.3	59.7	26.8	97.1	68.4	16.7
Bact. coli found.....	120	34	8	142	48	6
Per cent.....	68.6	20.8	11.3	81.1	48.0	12.5

It will be observed that lactose bile gives a generally higher percentage of confirmed tests than lactose broth. Where confirmation of the presence of members of the coli-aerogenes group only was considered, the advantage of lactose bile over lactose broth appeared to be slight or absent, but for the confirmation of the presence of *Bact. coli*, fecal type, the bile medium shows distinct superiority in the percentage of cases showing positive results. As might be expected, the percentage of confirmation in all cases was greater from tubes showing prompt gas formation than from those in which gas production was slow.

TABLE 3

PROBABILITY OF ISOLATING COLI-AEROGENES ORGANISMS AND BACT. COLI RESPECTIVELY FROM WATER WITH LACTOSE BROTH AND LACTOSE BILE

Gas formation	No. of cases		Coli-aerogenes group			Bact. coli (fecal type)	
	Broth	Bile	Isolations from		Factor %	Broth	Bile
			Factor %	Broth			
10% in 24 hours.....	812		94.3	766		68.6	557
		802	97.1		779	81.1	
Less than 10% in 24, 10% in 48 hours.....	222		59.7	133		29.8	66
		225	68.4		154	48.9	
Less than 10% in 48 hours	229		26.8	61		11.3	26
		172	16.7		29	12.5	
Total.....	1263	1199		960	962		649
Ratio.....	100	94.9		100	100.2		100
							120.5

Combining the data presented in tables 1 and 2, an attempt was made to show the probability of isolating coli-aerogenes bacilli and *Bact. coli* from water, using lactose broth and lactose bile, by considering the percentage of confirmations in table 2 in the light of the relative numbers of tubes showing gas with each of the two media, as outlined in table 1. The summary, made in table 3, indicates little or no difference between the two media for the detection of members of the coli-aerogenes group as a whole. On the other hand, when detection of the presence of *Bact. coli* (fecal type) is required, lactose bile shows a distinct superiority over lactose broth, giving approximately 20 per cent more confirmations for this organism.

SUMMARY AND CONCLUSIONS

A study was made of the relative value of lactose broth and lactose bile as enrichment media for the detection of pollution in farm well waters, data being presented covering 482 samples of water in which gas production was observed.

Confirmatory tests indicated little or no difference between the two media for the detection of members of the coli-aerogenes group as a whole. However, for the detection of *Bact. coli* of fecal type, lactose bile was found superior to lactose broth.

If the presence of organisms of the coli-aerogenes group is regarded as the criterion of pollution of water, no advantage in adopting lactose bile in preference to the standard lactose broth is indicated. If, however, *Bact. coli* (fecal type) is regarded as the index of pollution, a point of view which is receiving increased support, lactose bile is to be preferred to lactose broth for use in presumptive tests.

Acknowledgment

The authors wish to acknowledge the assistance of Messrs N. B. McMaster and J. C. Petitclerc, formerly of this laboratory, in connection with the analysis of the water samples.

REFERENCES

¹American Public Health Association, 1925. *Standard Methods of Water Analysis*, Sixth Edition.

²Bardsley, Doris A. 1926. *B. coli* as an index of fecal pollution of water supplies. *J. Hygiene*, 25:11-25.

³Brown, J. W. and Skinner, C. E. 1930. Is the Eijkman test an aid in the detection of fecal pollution of water? *J. Bacteriology*, 20:139-150.

⁴Chen, Chen Chong and Rettger, Leo. F. 1920. A correlation study of the colon-aerogenes group of bacteria, with special reference to the organisms occurring in the soil. *J. Bacteriology*, 5:253-298.

⁵Hicks, E. P. 1927. The value of methods for the differentiation of bacilli of the coli-aerogenes group when applied in Shanghai. *J. Hygiene*, 26:357-361.

⁶Levine, Max. 1921. Bacteria fermenting lactose and their significance in water analysis. Iowa State College of Agriculture and Mechanic Arts. *Bull.* 62.

⁷Prescott, S. C. and Winslow, C.-E. A. 1924. *Elements of Water Bacteriology*. Fourth Edition.

⁸Schöbl, Otto, and Ramirez, José. 1925. The fallacy of the test for lactose fermenters as an indicator of fecal pollution of waters. *Phillipine J. Science*, 27:317-24.

20th Annual Meeting
Canadian Public Health Association
and
6th Annual Meeting
Saskatchewan Health Officials' Association
REGINA, SASKATCHEWAN
JUNE 17th, 18th, 19th, 1931
PLAN NOW TO ATTEND

What is a Stillbirth?*

EUGENE GAGNON, M.D.

Statistician of the City of Montreal

VITAL Statistics are generally called the bookkeeping of the many facts and incidents pertaining to human life. It is carried on with much the same principles as those employed in commercial bookkeeping.

However, it is necessary to note a very important difference. Commercial statistics, if properly kept, can give an accurate account of all transactions involved, and the facts forming the basis of commercial accounts are accurate records of the transactions. Vital statistics are not always accurate, the data may be incomplete and subject to errors, they may not always be recorded in the same manner. The interpretation given them may differ according to the mental attitude of the person giving the information and also according to the mental attitude of the statistician himself. This seems to be especially true when we consider the statistics of stillbirths.

In order to be able to draw conclusions from vital statistics, it is necessary that the same facts be recorded in the same manner by all statisticians; otherwise no comparison could be made. On the other hand, statistical rates in themselves are of little value; it is only by comparison with other rates representing similar facts elsewhere, that deductions can be made and conclusions arrived at. In vital statistics, stillbirths form a class by themselves. They are not counted as births, nor as deaths. It is therefore very important that the definition of the word be carefully established, because if a birth be counted as a live birth in one province and as a stillbirth in another, the rates of stillbirth will not be comparable between the two provinces, and the infantile mortality will be increased in one province and lowered in the other.

Hence the importance of the question: What is a stillbirth?

To answer that question it is necessary to consider and recall:

- (a) The general principles and definitions bearing on life, birth, abortions, etc.
- (b) The medico-legal side of the question and the jurisprudence established in the Province of Quebec.
- (c) What is actually called a stillbirth in the United States of America, some European countries and in Canada.

*Read before the Section of Vital Statistics of the Canadian Public Health Association, at its 19th Annual Meeting, Toronto, May 19-21, 1930.

What is a Birth?

To be born is to come into the world. But a child may come into the world alive or dead, thence the distinction between a live and a stillbirth. Death is a negation of life and needs not to be defined. But what is *life*? Life may be said to be a property or a peculiar quality of all organic matter that enables it to assimilate food, to grow and to reproduce itself. Assimilation and dis-assimilation or nutrition is the fundamental factor of organic life; the two other properties, growth and reproduction, cannot exist in the absence of nutrition. Nutrition itself is not a causative factor of life, but is the result of the transformation and the combination in the body of various substances, solids, liquids and gaseous, brought to the cellular elements of the body. The digestive system brings in the mineral and the organic substances, respiration brings in the oxygen which is absolutely necessary to insure the chemical transformation of the other substances.

Starling, in a study of vital phenomena in assimilation and dis-assimilation, says: "In the vast majority of living organisms, the energy for their activities is derived from the oxidation, ultimately of the foodstuffs, but immediately of molecules attached to the living protoplasm. A necessary condition, therefore, for the life of these cells, is the presence of oxygen."

Oxygen is taken from the air by the red cells of the blood and diffused into all parts of the body by the action of the heart. The function of the various organs of the human body are regulated by the nervous system.

It is necessary for the nervous system to function normally that a constant and regular supply of oxygen be brought to it. Whenever the supply of oxygen is lowered to a certain degree or stopped altogether, either from the obstruction of the respiratory ducts or from the suspension of the action of the heart, the nervous system ceases to function and unconsciousness or apparent death appears. It is mostly impossible to determine exactly the moment when life goes out of the body. *Life is extinct* when the cells of the body have lost their property of assimilating nutritious substances, and that is realized at a time more or less remote from the moment of apparent death, according to conditions existing at that time.

All organic matter does not possess life to the same degree of perfection, and there are three degrees in organic life: vegetative, animal and human.

(a) The main properties of vegetative life are characterized by nutrition, growth and reproduction.

(b) The main properties of lower animal or sensitive life are the same, plus movement and sensations.

(c) The main properties of human or intellectual life include all the above, plus intelligence and volition.

Thence the definition: "*Man is a thinking animal*"; or an animal endowed with reason.

Roman Catholic philosophers and theologians teach that the human soul is the principle of human life and that the human soul is created by God for each human being. Wherefrom the question arises whether the human soul is created and united to the ovule at the time of fecundation, in order that the human soul may, from the start, build and shape the human body to which it will be associated in future life; or whether it is created and united to the body only later and when the embryo has acquired such a development that the various organs are differentiated, which takes place in the course of the second month after conception.

This question cannot be solved with certitude, but at the present time there is a general tendency to accept the first hypothesis.

Moreover it is also a Roman Catholic doctrine that baptism is a necessary condition of the admittance of a human being into heaven. In consequence of that doctrine the right and duty to minister baptism are not reserved exclusively to the ministers of the church, but are also granted to any member of the church. As a matter of fact, the attending physician of Roman Catholic faith is often called to minister baptism to a new-born child, whenever there is any possibility that the child be still alive. In the case of doubt as to the child being alive or dead, he must give it the benefit of the doubt, and pronounce it alive.

It has not been my intention in giving these explanations to enter into or provoke a philosophical discussion over these matters of creed and religion, but I have thought it necessary to make a brief outline of the Roman Catholic doctrine on this subject in order that those who do not profess the same religion may better understand the point of view of the Roman Catholic physicians, who in the case of doubt as to the presence of life in a new-born child, will declare it born alive on the death certificate, while his protestant confreres will pronounce it a stillbirth. This is, at any rate, the answer I have received from protestant physicians who have been asked. Thence the inaccuracy of stillbirth statistics based only on the declaration of the attending physician, and the necessity of a statistical definition of the word stillbirth applicable to all births, irrespective of religious feelings or creeds.

Having considered the religious aspect of the problem we may now ask: What is a live birth? We all agree that life exists in the embryo from the very moment of conception. But is it vegetative, animal or human life? It is immaterial for the needs of this argumentation and we leave it to the philosopher to discuss and find the solution. However, we may state with certainty, that from the moment of conception until the child is completely separated from its mother, or at least until it takes its first breath, it receives all that is necessary for its nutrition and growth from its mother; the circulation of the blood exists in the embryo and the oxygen and other nutritive substances are supplied by the mother through the placenta, even after the complete expulsion of the child from the mother. So long as the placenta is not detached the child may continue to live for a few minutes; in the absence of respiration, the heart may continue to beat, but this life is only the continuation of the foetal life. I therefore consider that the first vital act made by the child is the first movement of spontaneous respiration.

There is also another point very important from a statistical point of view: it is the viability of the child. A foetus is considered viable when all its organic system has attained a state of sufficient maturity to enable it to function independently from the mother with a chance of survival. The border line between viability and non-viability is not

easy to draw, as some foetuses at six months of uterine gestation have acquired a greater development than others at full term of pregnancy. However, it is generally agreed that before the end of the six months a foetus cannot be born viable. I must add that there is now a tendency among physiologists and obstetricians to extend that limit to the end of twenty-eight weeks or 196 days.

In the Province of Quebec and in the European countries where the Napoleonic code is the foundation of civil law, there is a legal provision to the effect that a child cannot inherit or have the benefit of a will or a donation unless it is born alive and viable.

Littre, in his medical dictionary, says that a new-born child may give evidence of life by a few cries or by slight movement of the limbs and nevertheless have not attained such a development that it may live.

He says also that four conditions are required to declare a foetus viable:

- (a) It must have a sufficient organic development such as a height of 35 centimeters and a weight of one kilo; there must be sebaceous secretion of the skin; the nail must have grown to the tip of the fingers and the presence of meconium in the colon is also necessary.
- (b) It must have enough energy to respire completely, to cry and to move its limbs intensely.
- (c) It must not be affected at birth with a deadly disease.
- (d) It has to be exempt from any malformation non-compatible with life, such as acephaly and anencephaly.

In the Province of Quebec, the Hon. Justice Langelier, commenting on article 221 of the civil code, writes: "A child born less than 180 days after the fecundation must be declared non-viable.

"A child is viable when it is so conformed that there is a possibility that it may live outside the body of its mother.

"A child born non-viable has never existed as a person and cannot take part in an estate."

Recently, the Hon. Justice Sir François Lemieux, in the case of Allard vs. Monette, rendered a judgment in which he gave a definition of viability.

The learned judge said: "To inherit it is necessary to have a legal existence. A non-viable child cannot inherit, because it has no legal existence. A child is viable when it has a proper life completely extra-uterine and distinct from the life of its mother.

"Thus a foetus is viable which is apt to live or to continue to exist ex-uterino in such a manner as to be able to live during the ordinary course of life. It is not enough that the child be born alive, it is necessary that it be born viable which are two different conditions; because a child may be born alive but non-viable; it may, after birth, perform a few acts of organic life but not be so constituted that it may prolong its life.

"The dominant character of the viability is the complete respiration which constitutes life, the germ of life. A child must be considered as having lived, as being viable, when after its complete expulsion, it has respired in a complete manner and in a natural way. It is by complete respiration that the circulation of the blood is established in the lungs and the child can live properly. In these conditions, according to law, the child has civil life, because the first function which takes place in a new-born child is a complete respiration which constitutes life."

Later, in the course of his remarks, Sir François Lemieux, analyzing the testimony rendered by the attending physician, says: "The doctor came to the conclusion that the child was born viable. He gave a perfect definition of

viability, which is, a child born after at least six months of uterine gestation, does not present any gross malformation and has respired."

The Hon. Justice Langelier, commenting on article 227 of the civil code, writes: "It is recognized since antiquity by all physiologists that the shortest gestation is 180 days and the longest is 300 days. Therefore if a child is born viable it is to be presumed that, at least 180 days and not more than 300 days have elapsed since conception."

These long quotations give a good idea of the jurisprudence existing in the Province of Quebec regarding the interpretation of the word live birth from the legal point of view.

I have previously said that conclusion from statistics can only be drawn after comparison with other statistical data of the same kind established elsewhere. Let us now examine what procedure is followed in other countries and the other provinces of the Dominion to classify a birth as a stillbirth.

We will first have a glance at what is done in the United States of America.

The census bureau of Washington publishes stillbirth statistics for the states included in the registration area. As an introduction to such statistics, the report says:

"The annual collection of stillbirth statistics was begun in 1922. Prior to that year the bureau of the census presented such statistics but once, in 1918." After some explanation of the manner employed in the compilation of those stillbirth statistics, the reporter adds: "The interpretation of the statistics relating to stillbirths must be made with extreme caution because the completeness of registration is not known and the term stillbirth is not used in the same sense in the various states. Therefore it is suggested that persons interested in stillbirth statistics study table 'W' before drawing conclusions from the state ratios of stillbirths. Table 'W' shows for each state in the registration area the period of utero-gestation to which a stillborn child must have advanced before a certificate is required to be registered."

An analysis of that table "W" gives the following results under the heading just mentioned:

Registration after 4 full months.....	18 states
" " 4½ "	2 "
" " 5 "	3 "
" " 6 "	3 "
" " 28 weeks.....	2 "
" " 7 full months.....	3 "
No definite rule—New Hampshire and Delaware.	
Any product of human gestation that may be recognized as such—Maryland.	
Total.....	34 "

This short enumeration of the discrepancies existing between the states in the registration area of the United States on this particular point, emphasizes more clearly than any other comment the caution with which stillbirth statistics ought to be studied. To obtain more direct information I have written to the registrars of vital statistics in fourteen states, asking:

(a) At what period of utero-gestation may a birth be considered alive or a stillbirth?

(b) What is considered an evidence of life in a new-born child?

The answers received to the first question, correspond to the information contained in table "W" just referred to, exception being made for the States of Ohio and New Jersey, which in table "W" are put in the group of four months of utero-gestation, while their answer is: "No period specified by law."

For New Hampshire the answer was: "Enough development to be viable."

The answers to the second question as to what is considered an evidence of life, were as follows:

North Carolina—Breathing only.

Pennsylvania—Respiration. No instructions given to attending physicians who, no doubt, in the absence of respiration will report the case as stillbirth.

Ohio—No definition of stillbirth; it is left to the appreciation of the attending physician.

Michigan—Movements of voluntary muscles or efforts to breathe after birth are mentioned in the law. However, in the letter received, emphasis is only made of the movements of voluntary muscles.

Maryland—A live born child is one that breathes after birth.

In the nine other states, which are: District of Columbia, Rhode Island, New Hampshire, New York, New Jersey, Massachusetts, Minnesota, Maine and Illinois, the statistical rules, as adopted by the American Public Health Association in 1908 and revised in 1913, are generally followed.

Through the courtesy of Dr. Andrew Hall, director of the Department of Public Health of Illinois, I received a copy of these rules, which have been approved by the statistical department of Washington. Let us quote those related to stillbirth.

Rule Five—Children born alive and living for any time whatever, no matter how brief after birth, should not be classed as stillbirth, even though reported by the attending physicians or midwives as stillborn.

Rule Seven—Premature births (not stillborn) should be included in total deaths.

Rule Eight—Premature births (stillborn) should be classed under stillbirths, and should not be included in total deaths.

Rule Nine—Direct the attitude to be taken by the registrar when a birth is reported as stillborn, with an inconsistent statement of age also given; more details are to be obtained in such cases.

Rule Ten—When the age of a premature child is left in blank, the registrar should endeavour to obtain a statement of age or at least that the child was born alive. In the absence of any further data the case should be compiled as stillbirth.

Rule Sixteen—Statement of viability or non-viability of an infant prematurely born shall not be considered in classification.

Rule Seventeen—For registration purposes, stillbirths should include all children born, who do not live any time whatever, no matter how brief after birth.

Rule Eighteen—Birth (completion of birth) is the instant of complete separation of the entire body of the child from the body of the mother. The umbilical cord need not be cut or the placenta detached in order to constitute complete birth for registration purposes.

Rule Nineteen—No child that shows any evidence of life after birth would be registered as a stillbirth. The words "any evidence of life" shall include action of heart, breathing, movements of voluntary muscles.

These rules need not be commented on; they speak for themselves. They give a clear idea of what is intended to be considered a live and a stillbirth. The statement as to viability and non-viability (rule sixteen) must be remembered and may be discussed, because it eliminates the distinction generally made between abortion or miscarriage and premature birth. According to Littré, an abortion is the expulsion of a non-viable foetus, the expulsion taking place before the expiration of six full months of pregnancy. After six months, the expulsion is called a premature birth. It is a well-known fact that a foetus born after four full months of pregnancy may live for a few hours. This consideration seems to have guided the adoption of the rule sixteen with the result that any foetus born alive, whatever be the foetal age, be considered a live birth. Theoretically, it looks quite right. But in practice, one may ask how many foetuses born at four months, for instance, would be declared or reported either as a live or a stillbirth. If all such births were reported, one would expect that the states where the four months law exists would have the highest rate of stillbirths, because nearly all such foetuses are born dead. But as a matter of fact, if one looks over the stillbirth rates of the states of registration area for year 1926, he finds that, with a few exceptions, the rates do not differ much; moreover, it is found that California and Vermont, under the four months rule, with a rate of 2.9 and 2.7 respectively, have about the lowest rates of all states.

As regards rule nineteen, which gives as evidence of life any action of the heart or breathing or movement of voluntary muscles, I have already discussed this point, and I leave it to your appreciation.

The League of Nations has published in recent years, a series of studies on the statistical procedure adopted in some European countries, and what follows is extracted from those studies.

In Austria the law prescribes that all children who, being born dead, have reached a state of development which indicated the possibility of independent existence, are to be registered; but that all others, which mean non-viable children, are to be regarded as abortions or miscarriages and registration of such births is not required. It is remarked that in Roman Catholic districts, stillborn children are baptized, and as registration of birth is made by the religious communities, registration of some stillbirths is made as live births, rendering the stillbirths statistics inaccurate. This is a condition quite similar to that existing in the Province of Quebec as explained previously.

In Spain, registration of all stillbirths is compulsory since 1919. Registration of a stillborn child must be effected within 24 hours of the occurrence of such birth.

For legal purposes, stillborn children are those born without signs of life and those born alive, but dying within 24 hours after the severance of the umbilical cord. For statistical purposes they are classified as follows:

(a) Those born dead.

- (b) Those dying during or at the moment of birth.
- (c) Those dying within 24 hours of birth.

No definition of live birth is given.

In the Republic of Portugal a special register is kept for stillbirth and the following information must be entered therein: date of registration, hour and place of birth, sex and legitimacy of the child, name and profession of parents, number of children born from this mother alive and stillborn, period of gestation, nature of obstetric aid, whether simple or multiple birth.

No definition of live or stillbirth is given.

In Belgium, officially a stillbirth is defined as the birth of a dead child after the 180th day of gestation. But, according to established procedure, under stillborn are included:

- (a) Children born dead.
- (b) Children born alive, but dying before registration (that means within three days of birth). In other terms, if a child dies before being registered as a live birth, it is a stillbirth. All such births are recorded in a special stillbirth register only, and not in the ordinary birth and death register.

In Holland, the procedure is quite similar to that followed in Belgium with the exception that no mention is made of the period of uterine gestation. There is no mention either of a special register for stillbirths.

Stillbirths include:

- (a) Children born prematurely and dead.
- (b) Full-term children born dead.
- (c) Children born alive, but dying before registration which means three days plus the intervening holidays up to six days in some instances.

The registration is made in the register of death with the endorsement "presented dead." The registrars require also:

- (a) The period of gestation.
- (b) Whether the child was born dead or whether the child had breathed, and if so for how long a time.
- (c) The presumed cause of death.

In Denmark, a footnote on the birth certificate gives the following definition of a stillbirth: "Premature born children, born alive, to be recorded as live births. And a foetus born without obvious signs of life in the twenty-ninth week of pregnancy or after, should be recorded as a stillbirth; but if born before the twenty-ninth week it should be deemed a miscarriage and not recorded."

No explanation is given of obvious signs of life.

In Norway, stillbirths are defined as births without life after the twenty-eighth week of pregnancy. Abortion and stillborn foetuses born before the end of the twenty-eighth week are not to be registered.

In England and Wales, no record of stillborn children may be made in a register of births and deaths. But, if a child is born alive, it matters not how soon it may die, both the birth and the death must be registered. A child is deemed to be stillborn, when after being completely born, it has not breathed or shown any sign of life. The term completely born is understood to indicate complete expulsion from the body of the mother, independently of complete separation. No mention is made of the product of miscarriage or abortion, and it seems that whenever a child is born alive according to the above definition whatever be its foetal age, a live birth is registered.

This concludes the information I have about the definition of stillbirths in European countries. In all, except England, non-viable children are not counted either as births or deaths; they are not recorded at all and the only comment to be made is that stillbirths statistics in

European countries are hardly comparable owing to discrepancies existing in the registration of stillbirths and the definition of the word itself.

Now, what is the situation in Canada?

I have written to the registrars of vital statistics of each of the nine provinces asking the following three questions:

(a) At what age is a foetus considered as a live or a stillbirth?

(b) What is considered an evidence of life in a new-born foetus or child?

(c) If action of the heart, breathing and movements of voluntary muscles are considered as evidence of life, is it necessary to classify a birth as a live birth, that the three signs be apparent or if any one of the three constitutes the evidence of life?

The answers to the first question are as follows:

Manitoba	5 months
Alberta	24 weeks
Quebec and Saskatchewan	6 months
British Columbia	28 weeks
P.E. Island, New Brunswick and Ontario	7 months

The registrar of Nova Scotia has sent to me their Vital Statistics Act, with this remark: "You will note that the act does not define what constitutes a live or a stillbirth. This is a matter for the opinion of the attending physician."

To the second question about evidence of life, the answers were:

Prince Edward Island—Heart action, breathing.

Nova Scotia—Not defined.

New Brunswick—Respiration after complete separation of the child from the mother and placental cord.

Quebec—Breathing.

Ontario—No rule, left to doctor's discretion to decide if child is born alive.

Manitoba—Heart action or respiratory efforts, movements of voluntary muscles.

Saskatchewan—If a child breathes after delivery, it is considered a live birth.

Alberta—Action of heart or lungs.

British Columbia—Pulmonary respiration.

The third question was asked because, on account of the answers received from some of the states, where the three evidences of life enumerated in rule nineteen of the American Public Health Association, were accepted as evidence of live birth, the text of the answers did not give a clear indication that any one of the three signs mentioned was sufficient to declare a birth as live.

The answers to the second question by the provinces of Canada were generally clear and the third question became useless. The Director of Vital Statistics of Saskatchewan adds as a comment, that without action of the heart, the child could not breathe, and I am strongly of the same opinion. I do also believe that in the absence of the action of the heart and respiration, movements of voluntary muscles are not likely to be observed.

This is already a very long lecture in which I have strived to give

you an idea of what is considered a stillbirth in different countries, states and provinces.

I do not think it necessary to insist on the discrepancies existing in the interpretation of the word stillbirth, and if we want stillbirth statistics to be of any value, it is necessary that all the provinces come together and adopt a definition acceptable not only by all the provinces, but also by all the nations.

The League of Nations, after a series of studies referred to in this paper, has set down for statistical purposes a definite proposition, which has been submitted to all interested nations for their approval. The province of British Columbia has already adopted the definition set down by the League of Nations, which reads as follows:

"A dead birth or stillbirth is a birth of a foetus after twenty weeks of pregnancy in which pulmonary respiration does not occur.

Such a foetus may die, (a) before, (b) during or (c) after birth.

Death must have occurred before breathing took place."

In Montreal, we are now following a rule quite similar to the above definition, excepting, that in accordance with the Civil Code, we reduce the term of uterine-gestation to 26 weeks. We classify as stillbirths all foetuses born before the end of the sixth month of pregnancy, even those who have lived any extent of time. But we keep a separate account for non-viable births, and the stillbirth rate is calculated on birth of foetuses of at least six full months of pregnancy. In our report for the year 1928, you may find twenty premature births under six months of gestation, classified as live births. Those cases would now be classified with the stillbirths, unless after inquiry from the attending physician, we came to the conclusion that the duration of gestation had been more than 180 days or six complete months. Besides those premature births classified as live births, we have also 214 premature births classified as stillbirths for which the duration of gestation was as follows: three months (35), four months (64), five months (115). Total—(214).

The rate of stillbirths in the Province of Ontario is much higher than in the Province of Quebec. The report of the Province of Ontario does not show the differential rate, between urban and rural population, but in the Province of Quebec and in the United States, the urban rate is from three to five per 1,000 higher than the total rate, and Montreal has about the same rate as the whole of the Province of Ontario (39.7 per 1,000 for Montreal in 1928, 39.2 per 1,000 in Ontario).

On the other hand, if I have rightly interpreted the rules existing in Ontario, no stillbirth in that province need be declared if they have not attained seven full months of pregnancy. Therefore, if with such a restriction the stillbirth for the whole Province of Ontario nearly equals the rate in Montreal, in which are included many premature births, it is not unreasonable to conclude that according to the difference of mental attitude of the attending physicians, many births in Ontario are declared as stillbirths which would be pronounced live

births in Montreal. This would also explain in part the higher rate of infantile mortality in Quebec compared to the other provinces.

It may be argued that this result can be attributed to a more complete declaration of stillbirths in Ontario, but the number of stillbirths reported in Montreal for cases pertaining to early months of pregnancy appears to be sufficient evidence that stillbirths are equally well declared in Montreal.

This comparison between a city of one province with another province, is not made with any idea of discrimination nor to criticize what is done in another province. It is only to emphasize the great need of more uniformity in statistical methods in order that comparisons may be rendered accurate.

In the Province of Quebec a special form is used to declare non-viable births, which means births before complete six months of pregnancy. In the year of 1929, we received 275 such forms. They constitute a very interesting record, and I think they are of great statistical value for the study of maternal death as correlated with abortion and also for the study of the causes of abortion.

Stillbirth being neither a birth nor a death, it seems to me that the actual practice of requiring that a birth and a death form be filled in the case of a stillbirth, is obsolete. In my opinion a special stillbirth form should be adopted with specific instructions printed on the back as to the manner of filling that form.

The ordinary death form calls for a cause of death, and the physician filling it will naturally assign the cause of such deaths to premature birth, congenital debility, dystocia, etc., etc. What is important to know in the case of a stillbirth is—not the cause of death, but why the child has been born dead. This means that the parental influence on the product of conception must be studied. It is therefore necessary that the special stillbirths forms be so arranged that the needed information may be supplied. The international list of the causes of stillbirths may be used for that purpose, if one bear in mind that said list does not allow the recording of all the principal facts and that some of the headings at least ought to be divided.

Doctor Hemenway, of the Department of Public Health of the State of Illinois, has also made a very interesting suggestion to the effect of causing to be reported on such special forms, not only stillbirths but also all cases of abortions and deaths of children born alive but dying in the first week after birth, in order that parental influences on such cases may be detected and classified.

Summary and Conclusion

Statistics of stillbirths are not accurate, cannot be compared and are of little value because:

(a) There is not at the present time a definition of the word stillbirth, internationally accepted and adhered to by all statisticians.

In the United States the definition and rules adopted by the American

Public Health Association are not followed by all the states, and the great variety of foetal ages at which a birth or a stillbirth must be reported, renders the information received hardly comparable.

In many countries of Europe the classification of a birth as a stillbirth includes not only stillborn children, but also the live born children who died before registration of the birth, which means a higher stillbirth rate and a much lower infantile mortality.

In Canada there is no definition or rule applicable to all the provinces. Each province makes its own law and, in some of the provinces having no rule at all, a birth is classed as a stillbirth when it is so stated by the attending physician. The average practising physician has no idea of statistical process and requirements, and the information received from him although given in good faith is often statistically inaccurate.

(b) In the Province of Quebec, owing to the preponderance of the Roman Catholic faith, the tendency is, whenever there is a doubt that a new-born child is born alive or not, to report it as a live birth; thence the stillbirth rate is lower and the rate of infantile mortality is increased.

I therefore propose that a special committee be formed in which the Dominion Bureau of Statistics, each of the provinces and the large cities of the Dominion would be represented, with the following object:

1. To define clearly what is to be considered for statistical purposes a live and a stillbirth, distinguishing: (a) Abortions or castlings; (b) premature births; (c) full-term births.

2. To discuss the opportunity of adopting a special form for the declaration of stillbirths, and if decided in the affirmative, to prepare such a form with the necessary instructions to attending physicians.

3. To study the opportunity of making it obligatory that all abortions be reported and the stillbirth form be used for the declaration of such births.

4. To study other statistical problems that may be common to all provinces.

5. To make representations to the provincial legislatures to the effect that the necessary legislation be adopted, embodying in their laws of vital statistics, any resolution of such a committee, tending to bring uniformity in the collection and tabulation of the statistics of the Dominion.

This subject, in many respects, has been treated in a way to show the point of view and conditions existing in the Province of Quebec. The writer feels that his information regarding the conditions in the other provinces is very incomplete and that he may not have represented them in their true aspect. If he has committed any involuntary errors he is very anxious that they be rectified.

The writer is also indebted to many persons for valuable information: namely to Rev. Father Laurendeau of the Jesuit Order and Professor E. G. Asselin of the University of Montreal, for their revision and approbation of the religious and physiological aspects of the problem; to the registrars of the provinces of the Dominion and of various states, for their kindness and their willingness to answer questions and to help. To all I wish to express my most sincere thanks and my deep gratitude.

The Public Health Nurse in the Control of Tuberculosis*

R. E. WODEHOUSE, O.B.E., M.D., D.P.H.

Executive Secretary, Canadian Tuberculosis Association, Ottawa, Canada

WHEN your secretary wrote asking that I give this paper, I immediately replied accepting and volunteering the information that I favour full health programmes in public health nursing in contradistinction to tuberculosis visiting nurses. This opinion is the result of years of casual observation. I am sure I cannot debate the subject pro or con. It is just one of those things one accepts in his good judgment without earnest study.

I first thought I would risk an expression of ignorance on nursing and develop a paper, without reference to the literature, dealing freely from personal experience of the ways in which nurses could help the anti-tuberculosis cause. Then I relented and read the introduction to "The Tuberculosis Nurse" in order to get an idea of what you might fairly expect of me. I found this encouraging remark, "In the anti-tuberculosis campaign the nurse must look to medical science for the plan and inspiration of her work. Her attitude in the tuberculosis campaign must always conform to the medical attitude, although she may and indeed has added valuable material for building up this attitude."

Those under whom you trained are sufficiently intimate with the detail and technique of home visiting in tuberculosis or any other preventable disease. It would appear to me that my best function would be to try and lay before you such facts or theories as we are cognizant of in our office, which might influence your mental attitude towards the practice of visiting homes to decrease the incidence of tuberculosis.

Such subjects as nursing methods, layman and nurse, training, duties (in the clinic, in the home, in the community, with the physician), generalized versus specialized nursing, co-ordination and the rural nurse, can be studied from text books written by members of your own profession, or by lay secretaries like Phil Jacobs or by medical officers of health. In any case, I have neither had nursing experience nor have I taught such subjects and will not therefore bring "coals to Newcastle."

TUBERCULOSIS REQUIREMENTS

The greatest result that I hope for from home visiting by public health nurses is:—

1. That the homes will be better maintained.

*Delivered to the Public Health Nursing Section, Canadian Public Health Association, Toronto, May 21, 1930.

2. That proper agencies will be brought in touch with the home to try and right all social welfare problems and thus assure moral and financial stability including the ability to provide proper food, clothing, rest and housing.
3. That debilitating conditions will be detected and remedied.
4. That complete medical examination will be made if suspicions warrant it.
5. That cases of tuberculosis will be treated in sanatoria if possible.
6. That all members in known infected homes will be examined medically every six months as contacts.
7. That every preventive practice will be instituted in the home and sufficiently frequent visits will be made to ensure their continuance.
8. That all hospital, clinic, school and nursing services will be co-operative with an efficiently organized and maintained exchange of helpful information and records.
9. That home visiting nursing services will be established for all of our population.
10. That social welfare provisions and municipal assistance in the cost of the sanatorium care of patients will be readily available without delay in all the areas where home visiting nurses are established.

THREE IMPORTANT FACTORS

It is essential that the nursing service should be daily in touch with the school nursing service, the registration of deaths and with the tuberculosis or chest diagnostic clinics.

It is very important that the most helpful methods known be employed by the nurses and that the latest knowledge, free of any wrong conception, be conveyed to the families.

It is very necessary that a weekly time card be maintained to show that a fair and proper proportion of the general home visiting nurse's time is devoted to tuberculosis.

Now let us consider a few things which have an influence on the practice of home visiting.

HUMAN TUBERCULOSIS IN CANADA

Canada lost in deaths in 1928, through all forms of tuberculosis, 7,850 citizens or at the rate of 81.4 per 100,000 population. These were divided as to sex in the proportion of 3,726 males and 4,124 females and as to pulmonary 82.5 per cent, and non-pulmonary 17.5 per cent. As to age groups, we find that 10.4 per cent were 9 years old or younger and that the distribution was equal as to sex. In the next age group, 10 years to 39 years inclusive, we find in each five year or ten year age group as used by the Federal Bureau of Statistics, that there are more

female deaths than male and for the total of these age groups forming 59.1 per cent of all the deaths from tuberculosis, 1,909 were males and 2,732 were females. From 40 years on, we find in each age group that the males form the largest number. The deaths from tuberculosis, all forms, of persons 40 years old or over formed 30.4 per cent and were divided thus, 1,406 males and 983 females.

As to the percentage of Canada's population falling into these age groups (1921 Census), I refer you to table I.

TABLE I
TUBERCULOSIS DEATHS IN CANADA
1928
AGE GROUPS AND SEX

Years of Age	9 and under	10-39	40 and over
Percentage of total population these ages.....	32.2	44.8	23
Percentage of tuberculosis deaths these ages.....	10.4	59.1	30.4
Percentage of male population these ages.....	31.6	44.5	23.9
Percentage of male deaths tuberculosis these ages.....	11.1	51.3	37.6
Percentage of female population these ages.....	32.9	45.1	22
Percentage of female deaths tuberculosis these ages.....	0.9	66.3	23.8

Population, all ages—1921 Census—Males 1064 per 1,000 females.

Total Tuberculosis deaths, all forms—1928—Males 903 per 1,000 females.

We do not know the incidence of the disease and therefore must base our studies on registered deaths. It is usually considered conservative to multiply the deaths in any one year by five to picture the number of living cases. Whether this proportion, mostly based on pulmonary tuberculosis, applies for non-pulmonary tuberculosis, I cannot say as I have no figures to study.

BOVINE TUBERCULOSIS

I have always felt that most workers and most writings on the general subject of tuberculosis have held that the bovine bacillus is a larger causative factor than it was or is. Recent work in the Department of Pathology in the University of Toronto justified my writing as follows in a letter last month:—"Doctor Price, in an article which I include herewith, in her last summary and conclusions No. 5, states—"If we may be allowed to draw conclusions in terms of percentage incidence of bovine infection as illustrated in this study, 13.4 per cent of tuberculosis in children, leading to operation, disablement and disfigurement, and occasionally leading even to death of the child,

is preventable and can be easily controlled by the simple means of proper pasteurization, or boiling of milk."

In the bulletin of the Canadian Tuberculosis Association, June, 1928, Dr. Louis Cobbett is quoted as saying that the human type of bacillus may be present in bones and joints as high as 81.3 per cent.

These two authorities suggest for so-called surgical tuberculosis 18.7 per cent as caused by the bovine tuberculosis bacillus.

In Canada in 1928, if we consider even 20 per cent of so called surgical tuberculosis of bovine origin, we have only 20 per cent of 17.5 per cent of all deaths chargeable to this agent, namely, 3.5 per cent. Even 3.5 per cent is worthy of consideration. Yet we have every reason to feel encouraged. As stated by Dr. Price, proper pasteurization of all this milk insures its freedom from this infection. Further encouragement rests in the fact that the Health of Animals Branch of the Federal Department of Agriculture is by its rapid expansion of activity placing hundreds of thousands of cattle under its tuberculin testing programme of eradication.

Home pasteurization where civic pasteurization does not exist should be taught and insisted upon by the nurse.

TRANSMISSION HUMAN INFECTION

Now this factor is well appreciated by all nurses, and all practices supposed to limit this transmission should be insisted upon. All servants and nurse-maids and nurses as well as members of families looking after babies and very young children, who require intimate handling, should have a very careful medical examination to see that they are not themselves suffering from the disease. Dr. Armand-Delille reported two tragic results of tuberculosis meningitis caused by missed cases in those employed to look after infants.

Dr. George Bigelow, of Boston, states as a result of five years' work on their ten-year programme of examining 100,000 under-weight children in Massachusetts, that "so far it would not appear that under-weight is the predisposing factor to tuberculosis that we had thought." Dr. F. Maurice McPhedran states:—"Children commonly gain in weight, lose their obvious symptoms and improve in colour while infiltration and excavation progress in the lungs." "Quite apart from humanitarian considerations and the right of the child, it is not economical to treat by half measures so violent, so insidious and so insistent a disease as tuberculosis of childhood and adolescence. Without accurate roentgenograms the physician is working in the dark." So is the nurse who neglects a tuberculosis history as an insistent call for complete careful medical examination of the whole household.

von Pirquet, the distinguished Austrian who gave us so many scientific helps, who once studied and lived in Baltimore left us food for thought. His last scientific communication was referred to by

Drs. Roatta and Armand-Delille in Canada last year and by Dr. Rist in Newcastle, England, last autumn.

Roatta stated that von Pirquet taught that the high incidence of tuberculosis and its increased fatality among young females was definitely due to decreased resistance dependent upon the new physiological processes established at puberty and maintained till menopause. Our statistics substantiate this as our increase sets in at twelve years of age and subsides apparently between forty and forty-five years, predominance is not evident in the gross figures after the age of thirty-nine years.

Roatta says we need more summer camps for 'teen age girls than boys, more rest homes for high school, college, business and industrial girls where six months or more rest can be given critical cases.

Rist states that von Pirquet established by tuberculin testing that those reacting positively, showing they possessed allergy, lost this positive reaction during certain conditions such as measles and regained it again after convalescence. This negative phase of resistance he called anergy. Therefore anergy producing complications permit flare-ups of arrested quiescent foci in the tuberculous, and, further, supply most inopportune periods for the sowing in individuals continuous doses of tuberculosis germs or mass doses in these unfortunate anergic individuals. Other diseases simulating measles as anergy producing factors are whooping cough, typhoid fever, syphilis in its secondary phase and epidemic influenza. Other circumstances which produce anergic phases in individuals possessing allergic properties to tuberculosis, are pregnancy, puberty, abortion, ovariectomy, menopause, even laparotomies.

Rist further stated that the psychic factor in the development of tuberculosis also is worthy of reference. Sorrow, pain, mental or physical or anxiety, especially when it is prolonged, repressed and therefore oppressive, play an undeniably part in the determination of lung tuberculosis. It is a comparatively rare occurrence to see the married tuberculous individual successfully infect his consort. It appears that only 10 per 100 of such exposed develop tuberculosis. Studies of the ten per cent, *i.e.*, casualties showed that the disease developed after the death of the originally sick consort or after the exposure had been ended, either after the consort had been sent to a sanatorium or oftener when he had died. Serious economic consequences follow such a death. The increased responsibilities of the survivor, as to education and welfare of children, financial anxiety, sorrow and distress are determining factors. Previously love, sense of duty and hope have buoyed them up and sustained their resistance.

It therefore behooves us to look sharply to the welfare and provision of the necessities to bereaved families and to watch over them medically and socially, in order that further catastrophe may be forestalled.

The public health visiting nurse is the missionary of hope in all the homes.

Interpretation of Reactions following Revaccination

N. E. MCKINNON, M.B. AND R. D. DEFRIES, M.D., D.P.H.

Connaught Laboratories and Department of Epidemiology, School of Hygiene, University of Toronto

THE reactions that follow revaccination have been classified according to the time of development and subsidence as (1), the "early" or "immediate" reaction, which appears and reaches its height within two or three days after revaccination (2), the vaccinoid or "accelerated" reaction which reaches its height between the third and ninth day and (3), the typical vaccinia which reaches its height from the tenth to the twelfth day. The "early" reaction has been interpreted as indicating immunity and, through this interpretation, has been given the name of "immediate reaction of immunity".³ It has been advocated that contacts of smallpox cases who show the "early" reaction might be released from quarantine(3, 4, 8, 11, 12). In this communication evidence is presented that the "early" reaction is an indication only of previous vaccination or smallpox, and that the real evidence of immunity is the failure of the revaccination to proceed to a vaccinoid or vaccinia when thoroughly potent vaccine is used with proper technique.

In vaccination against smallpox the living virus of vaccinia is implanted in the skin. It multiplies and around the nidus of infection a zone of inflammation develops. This local reaction at the site of infection is characteristic—the formation of a vesicle presenting a depressed centre in which crust formation commences early, leaving, after several weeks, a foveated scar; other signs of inflammation, induration and primary and secondary areolae accompany the vesicle. Failure to obtain this typical lesion in a person not previously vaccinated or who has not had smallpox is an indication that the virus used was not fully potent or that the technique was at fault. Exceptions to this are so rare as to be negligible. Repeated vaccination in cases of failure will practically always result finally in a "take".

It is entirely probable that, in all cases, at some stage of the infection the virus enters the blood stream. Utilizing Noguchi's observation that vaccine virus multiplies in the testicle, Ohtawara⁶ showed that the virus can be recovered regularly from the blood of rabbits during the course of cutaneous vaccination "takes". This has been confirmed repeatedly during the past five years in these laboratories and by others working with vaccine virus. Eckstein A., *et al.*¹⁵ recently recovered the virus from the blood of eight of seventeen children three to ten days after vaccination on the arm. With certain strains of vaccinia, typical vaccinal lesions are found in internal organs of laboratory

animals as shown first by Levaditi⁷. As might be expected from the blood distribution, these strains can be recovered, too, from organs which do not show macroscopic lesions. The occasional occurrence of generalized vaccinia in man is additional evidence of the spread of the virus throughout the body from the original focus of infection.

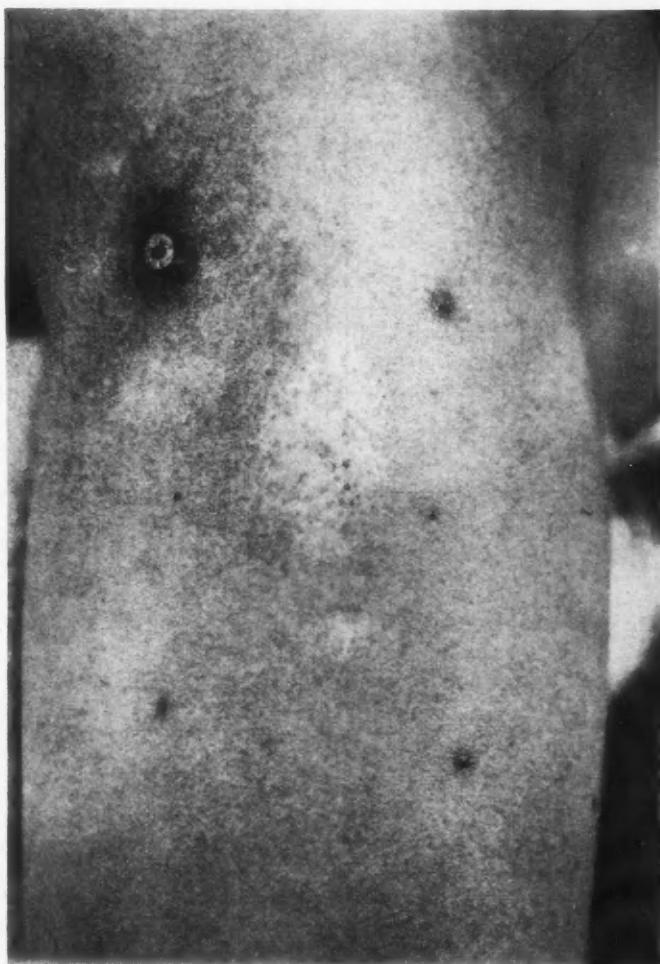
In revaccination the virus is implanted in the skin of individuals who may or may not or may in some degree retain either or both of two properties—each the result of the previous vaccination or smallpox. These are (1) *immunity* to vaccinia or smallpox, (2) *sensitivity** to some specific substance of the virus. The persistence of either of these influences the subsequent reaction to revaccination.

Any existing *immunity* tends to depress the subsequent revaccination reaction so that one seldom sees in such cases as perfect vesicle formation as seen in primary vaccination. The vesicle tends to be flatter, less regular in outline and with more marked tendency to early crust formation. It is an abortive vesicle entirely covered by crust before the tenth day at which time the vesicle of a primary vaccination would be reaching full development. Such an abortive reaction is called a *vaccinoid*. Other evidences of the infective process are present, such as induration and erythema at the site, axillary gland enlargement and often, some fever. The *vaccinoid* is a true *vaccinia* infection developing under the influence of a pre-existing partial *immunity*. The greater the degree of *immunity*, the sooner is the reaction aborted. In individuals who have complete *immunity* the infectious process *may* be extinguished without visible evidence of any reaction.

The second result of previous vaccination, *sensitivity*, accounts, on revaccination, for a response of an entirely different character—namely, an “early” reaction reaching full development within the first 48 hours after revaccination. This reaction is due to the *sensitivity* induced by the previous vaccination or smallpox, and is not, essentially, a reaction to an infection, *i.e.*, to living virus, as is the case of *vaccinia* and *vaccinoid*. It is elicited as readily and approximately to the same degree by completely inert virus. This was shown by von Pirquet¹ more than twenty years ago and has been the common knowledge of those who have worked with vaccine virus since that time. The “early” reaction is specific to the virus: the other constituents of the vaccine emulsion, as found in a similar emulsion of normal calf skin, fail to elicit it; an emulsion of *vaccinia*-infected testicle, autoclaved for two hours at 120°C., elicits the reaction in those showing the reaction to the dermal vaccine, but does not elicit any such reaction in individuals without previous vaccination or smallpox; an emulsion of normal rabbit testicle, similarly heated, fails to elicit the reaction; (occasionally a very transient erythema forms as in the case of calf skin emulsion). *Sensitivity*, as

*The term “sensitivity” is used in this communication to indicate an altered reactivity as shown by a quick response demonstrable at the site of implantation of the specific antigen in the skin.

FIGURE I

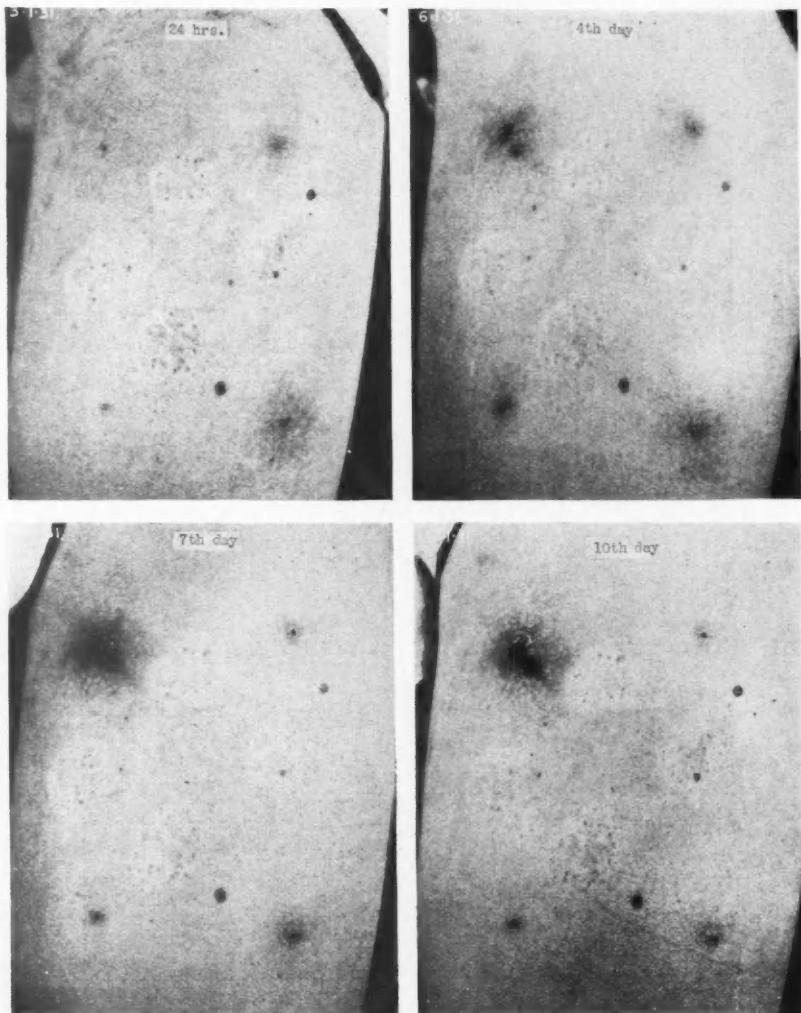


This picture was taken seven days after revaccination. The two upper sites received potent vaccine, the two lower sites received heat-killed vaccine. The technique used on the left-hand sites was a short scratch $1/16''$ —on the right hand, a single puncture through a drop of vaccine. The trauma controls are midway between.

"Early" reactions appeared similarly on all four sites receiving vaccine. The reactions at the sites where heated vaccine was used and where potent vaccine was used by the puncture method did not progress after 48-72 hours, but the site where potent vaccine was used with the $1/16''$ scratch showed good vesicle formation, *i.e.*, "vaccinoid" or accelerated reaction.

shown by the "early" reaction on revaccination, is not present invariably when immunity is present. This lack of correlation between sensitivity and immunity may be demonstrated by the vaccination of

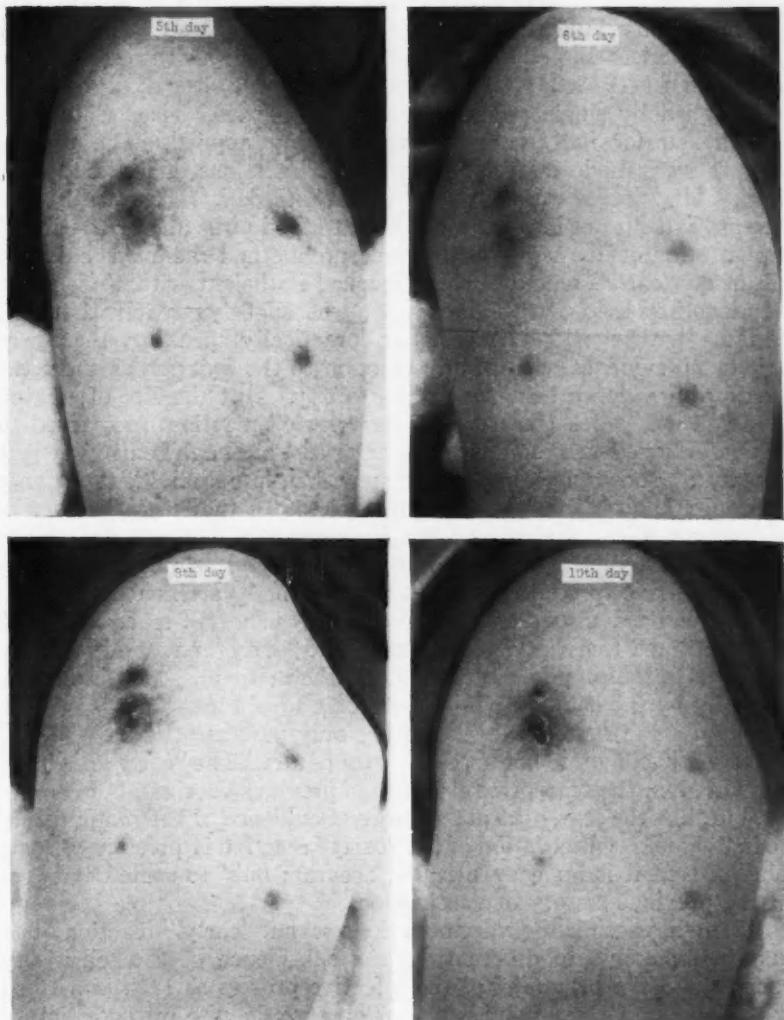
FIGURE II



Revaccination Reactions. Boy 15 years old—vaccinated successfully in infancy. Four scars in evidence. Revaccinated as in Fig. 1. Live vaccine used on upper insertions, scratch $1/16$ inch on the left and single puncture on the right. Vaccine, boiled for 10 minutes, on lower insertions, scratch on left, puncture on right. Trauma controls can be seen between the scars.

In 24 hours, early reactions on all four sites; puncture lesions much larger than scratch; reaction to heated vaccine equals that to live vaccine. All very itchy. 4th day—Site of insertion of live vaccine by $1/16$ inch scratch has shown steady increase; a second tiny auto insertion in evidence. Reactions at other sites retrogressing. 7th day—The vaccinoid on the scratch of $1/16$ inch has reached its maximum and as seen on the 10th day—is retrogressing. Evidence of the "early" reactions still seen.

FIGURE III



Adult age 25. In spite of repeated attempts, no history of successful vaccination at any time. Had very severe "chickenpox" in 1909—in bed seven weeks. Further details not known. Vaccinated 15.5.29 with live virus above and dead virus below, scratch on the left and puncture on the right. Early reactions on all four sites. Vaccinoid on scratch with live virus. Autoinsertion from rubbing in evidence on scratch.

recent smallpox convalescents, and may be observed, though more rarely, among those whose immunity had been induced by vaccinia. (It will be understood, of course, that intradermal injections of a greater quantity of material may demonstrate lesser degrees of sensitiv-

ity than are demonstrable by the ordinary methods of vaccination.) The presence of sensitivity, as evidenced by the "early" reaction, does not necessarily indicate immunity in the individual. This is well demonstrated in Fig. I. At one site live vaccine virus was applied to a scratch $1/16$ " long. At a distance of $1\frac{1}{2}$ ", virus of the same lot was applied by single puncture. Below these sites virus which had been boiled for half an hour was similarly applied. The trauma controls were made midway between the insertions of live and dead virus. The picture was taken on the seventh day. It is readily seen that at both sites of implantation of heat-killed virus and at the site of implantation of live virus by the puncture method there was evidence still of an "early" reaction which reached its height within 48 hours; the puncture lesion, with live virus, was slightly greater than the puncture with the killed virus, but, practically speaking, there was little or no evidence on it of any reaction to the *infection* as such, the reaction in evidence being one of *sensitivity*. But the site of scratch revaccination, which showed a similar "early" reaction, progressed to a well developed vaccinoid. In other words, although sensitivity was present, as shown by the "early" reaction, the individual did not possess immunity to any significant degree. In the revaccinations of final-year medical students at the University of Toronto during the past six years in the manner outlined for Fig. I, similar sensitivity reactions have preceded practically all the vaccinoids obtained. Figs. II and III also demonstrate this sequence of reactions which has been noted frequently by others. The "early" reaction is entirely analogous to the pseudo-reaction to diphtheria toxin, which is elicited as readily by the heated toxin or by atoxic toxoid and is likewise seen in immunes and susceptibles indicating only past association with the diphtheria bacillus and not necessarily immunity. The "early" reaction, therefore, like the scar, gives evidence of previous vaccination or smallpox, but, like the scar, does not give direct evidence of the immunity of the individual. Observation of the "early" reaction is possibly of some value in that it is an easy method, accurate only to some degree, of getting previous history of vaccination.

When a vaccinia or vaccinoid follows an "early" reaction it is usually impossible to differentiate the subsidence of the sensitivity reaction and the beginning of the infective process as each is masked by the other. Occasionally one does observe definite retrogression of the sensitivity reaction before a vaccinia or vaccinoid begins to show itself. When immunity is of such degree that the infectious process is extinguished by the third or fourth day it is, from a practical standpoint, impossible to say whether a sensitivity reaction alone occurred or whether a reaction to infection, *i.e.*, a vaccinoid, occurred simultaneously or later. Many of these reactions, as with the more typical vaccinoids, are really double reactions², a sensitivity reaction followed by a reaction to infection.

As the errors of the interpretation of the "early" reaction as an

index of immunity have come to light^{5 9 10 11 12 16}, emphasis has been placed on the absolute necessity of using potent virus and of observing the reaction on a later day, the fourth, fifth or sixth, at which time vaccinoids may be in evidence. Fig. I indicates that as well as using potent virus and making a later observation attention must be given to the manner in which the vaccine is applied. The short scratch of 1/16" has given, in our experience, more vaccinoids and vaccinia than has the single puncture, although the puncture, as has been noted by others, has shown regularly the larger early reactions. This is what might be expected, as it seems probable that rubbing virus on abraded cells over the length of 1/16" allows virus particles to come into contact with a greater number of live cells than is the case when the single puncture method is used. Experience shows that although the chances of obtaining the infection are enhanced by the use of 1/16" scratch, the resultant vesicle, even in primary vaccinations, seldom if ever exceeds one-half inch in diameter, whereas if multiple punctures are made through the one drop of vaccine in an effort to increase the chance of obtaining a vaccinia or vaccinoid, multiple lesions may result and coalesce so as to give a lesion larger than is desired in modern vaccination.

SUMMARY

1. Evidence that "early" reaction is not an index of immunity but is a sensitivity response is reviewed.
2. The great majority of vaccinoids and many so-called "early" reactions are really double reactions, two different processes, a sensitivity reaction followed by a reaction to infection.
3. The short scratch of 1/16" in revaccinations is more liable to proceed to a vaccinoid or vaccinia than is a single puncture. A larger "early" or sensitivity reaction is elicited by the puncture method than by the short scratch.

REFERENCES

Ivon Pirquet, 1911. Allergy, *Arch. Int. Med.*, Vol. VII, p. 383.
 Ivon Pirquet, 1911. The double reaction on cowpox vaccination, *München, med Wchnschr*, May, 1911, p. 937.
 Force, J. N., 1913. The skin reaction of the cowpox vaccination. A possible aid in public health administration, *Cal. State J. Med.*, Vol. XI, p. 290.
 Force, J. N., 1914. An investigation of the causes of failure in cowpox vaccination. *J.A.M.A.*, LXII, p. 1466.
 Peterson, E. (U.S. Navy), 1922. Revaccination against smallpox and a discussion of immunity following cowpox vaccination, *U.S. Nav. M. Bull.*, XVI, 294.
 Ohtawara, T. 1922. Studies on intrauterine vaccination, *Japan M. World*, September, 1922, Vol. II, No. 9, p. 254.
 Levadit, C. and Nicolau S., 1923. Ectodermoses neurotropes—Etudes sur la vaccine, *Ann. de l'Inst. Pasteur* Vol. 37, January, 1923, p. 1.
 Grubbs, S. B., 1923. Vaccination technique and certification at New York quarantine station, *Pub. Health Rep.*, Vol. 38, September 21, 1923, pp. 2201-2206.
 Leake, J. P., 1923. The immunity following smallpox vaccination, *Mil. Surgeon*, Vol. 53, p. 328.
 Leake, J. P., 1927. Questions and answers on smallpox vaccination, *Pub. Health Rep.* 42, January 28, 1927, p. 221.
 Force, J. N., 1927. Intradermal smallpox vaccination—A method for increasing the administrative value of the immediate reaction of immunity, *Pub. Health Rep.*, Vol. 41, April 15, 1927, p. 1031.
 Force, J. N. et al., 1929. Biometric studies of the multiple pressure method of vaccination against smallpox, *Univ. Cal. Publ., Pub. Health*, Vol. I, No. 6, p. 307.
 Hooker, S. B., 1929. Skin test for susceptibility to smallpox; human endermal reactions to killed vaccine virus, *J. Infect. Dis.* XLV, October, 1929, pp. 255-262.
 Andervont, H. B. and Rosenau, M. J., 1930. Vaccinia: studies of immunity, reactions and effects of heat, *J. Immunol.*, Vol. XVIII, January, 1930, pp. 51-63.
 Eckstein, A., Herzberg-Kremmer, H., and Herzberg, K., 1930. Clinical-experimental investigations on vaccinal encephalitis, *Deutsch med. Wchnschr* 56, 7, p. 264.
 Leake, J. P. and Force, J. N., 1930. The essentials of smallpox vaccination, *Pub. Health Rep.*, Vol. 45, November 14, 1930, p. 2793.

Editorials

DENTAL HYGIENE

THE recent pronouncement from the office of the Minister of Health for Ontario, that a government grant was to be awarded to municipalities carrying on a satisfactory type of dental service for school and pre-school children, leads one to consider the possible responsibility of a provincial health department in establishing personal and community interest in oral hygiene.

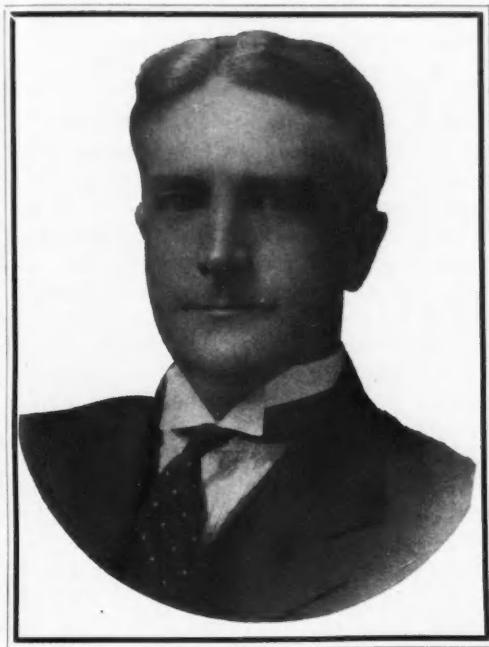
Much has been said in favour of the assumption by municipalities and governments of a measure of responsibility for the dental care of the children of those least able to pay for such service; while others have contended that this further evidence of governmental paternalism is undesirable. What difference is there between free dental service to those unfortunately situated economically and free medical service?—is the query propounded by many of those who are otherwise non-committal in the matter. Irrespective of the merits of the arguments advanced by these groups, the fact remains that there are from 25-40 per cent of the public who, at the moment, are unable to obtain or pay for adequate dental service, and, rightly or wrongly, the health authorities of certain municipalities have taken on the task of supplying this service to the younger age groups.

Since the enactment of legislation in Ontario in 1908, permitting school boards and boards of education to expend public funds for the purpose of providing gratuitous dental service to children of school age, steady progress has been made in the education of the public, both child and adult, in the value of conserving nature's dental machinery. Much of this progress can be credited to the dental profession itself, which, while at first largely indifferent to the dental needs of the younger age groups, has become the enthusiastic exponent of modern preventive dentistry.

The Department of Health for Ontario has further recognized its responsibilities to those people resident on the geographical fringe of the province, and such other sections as were not supplied with dental service. For four years, they have sent dentists into well chosen districts, in an attempt to render dental aid to these people. It is planned to further extend this service this year, so that, while adequately safeguarding the interests of the profession practising in these more sparsely settled areas, the children of these pioneers shall not be deprived of this essential health service.

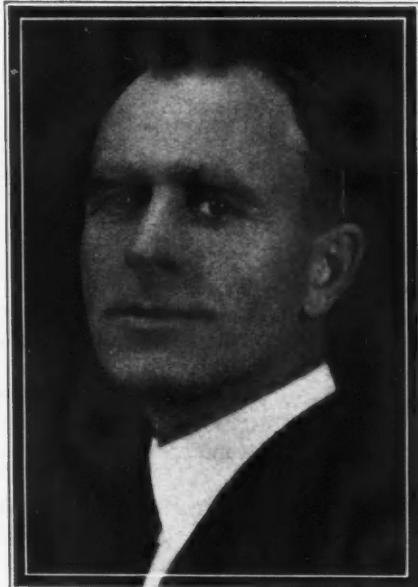
One hopes that those employed in this work, whether in a large centre, or in the smallest hamlet, will not lose sight of the educational opportunities while engaged in the correction of existing conditions.

CANADIAN PUBLIC HEALTH ASSOCIATION
OFFICERS 1931



Honorary President

THE HON. DR. F. D. MUNROE
Minister of Public Health
Saskatchewan



President

DR. F. C. MIDDLETON, D.P.H.
Deputy Minister of Public
Health, Saskatchewan

PUBLIC HEALTH NURSING

RUBY M. SIMPSON, REG.N., AND FLORENCE H. M. EMORY, REG.N.

TRENDS IN SCHOOL HEALTH

B. A. ROSS, REG.N.

SOME school systems have travelled further along certain lines of health supervision than have others. Accordingly, what may be considered in this article as tendencies are accomplished facts in some health programmes. However, at this stage of school health work, no school has yet realized all its ideals or reached its health goal.

With the recognition that many children enter school with physical and personality handicaps, and that the education of the child begins at or even before birth, there has commenced a strong movement to give the child a square deal by using the opportunities presented in this early period. Medical supervision of the expectant mother, child study and parent education groups, and the recognition by parents of their duty to have their child as physically fit as possible before entering school, are all hopeful forces in the promotion of the health of the pre-school and the school child. The pre-school years, whether spent entirely in the home or in part in the nursery school, are now admitted to be an integral part of his education.

School health supervision is no longer a one-man job. Teacher participation has been recognized in varying degrees in most school systems. The health staff now includes all who come in contact with the child,—the principal, the classroom teacher, teachers of special subjects such as household science or art, the doctor, the public health nurse, and

not least the janitor. With such a staff, it has been found advisable in some systems to have one person, usually known as the director or supervisor of health education, responsible for the co-ordination of interest and effort. This arrangement acknowledges in effect, that health is not merely a subject to be taught or to be assigned to one corner of the curriculum, but it is a force which should permeate the whole school day.

As it is the classroom teacher who has the greatest contact with the child during school hours, she is the logical person to carry the major responsibility of the daily task of teaching health and of helping to establish health habits and attitudes. The health teacher requires preparation for her work. Post-graduate courses have been available for several years to doctors and nurses. Health teaching and supervision are being included in more normal school programmes, and in summer courses for the teacher in service.

It is desirable for effective teaching that the health worker should be, as far as possible, an example of what she is trying to teach. She should have her remediable physical defects corrected, and should endeavour to carry out the rules of health. The health service available to the pupils should also be available to her. She should be encouraged to stay off duty for minor ailments, such as colds, as a preventive measure.

A health programme to be pro-

ductive of results must be based on the needs of the pupils; a mechanical made-to-order programme cannot succeed. Here is where the doctor and the nurse can make a real contribution. They have valuable information concerning the child, the home and the community aspect of health promotion which should be available to the teacher. Accordingly, in the school system where there is not a health education director or supervisor, the nurse can help the teacher understand the needs of her pupils and can recommend health materials. The nurse always stands ready to supplement the efforts of the teacher in individual and group instruction.

The school physician also lends assistance to other departments directly concerned in the health of the child such as the physical education department and the special classes. He co-operates with the private physician in order to strengthen the bond between the latter and the family on which basis most of our corrective programme ultimately rests. Notification of the family physician of the results of the school health examination is a right step.

The handicapped child is receiving more attention. Classes for the mentally subnormal and the physically handicapped are increasing in number. Children with less marked defects are looked after in the regular class where the teacher and the nurse are responsible for seeing that each is seated according to his need. In an up-to-date classroom no longer should one see a child hampered with defective vision or hearing sitting in the rear of the room.

With the axiom in mind that all

learning is reacting and there is no such thing as passive learning, educationists try to arrange that pupils may have as many opportunities as possible for exercise of health habits such as washing hands, drinking water, playing out of doors and living in well-ventilated rooms at a temperature of 65 to 68 degrees Fahrenheit, and that instruction may be suitable to the child's intellectual level, may meet his need and appeal to his interest.

In the secondary schools the adolescent needs health supervision and instruction. What has been said regarding healthful environment and a unified programme in the elementary schools also applies to the secondary schools. The health co-ordinator works closely with the heads of those departments which can make the richest contribution to the health education programme. The main approaches are through the student's recently awakened scientific and social interests, and his increased responsibility for personal health habits.

With the recognition of the educability of adults, and also with the desire to leave responsibility where it properly belongs, health educationists are including the parents in their health programme. In many school systems, efforts are made by principal, teachers, school doctor and nurse to reach the parents concurrently with their children. The health programme is undoubtedly strengthened when the parents because they are cognizant of the health instruction and activities in the school are in a position to promote their carry-over into the home and into other life situations.

INDUSTRIAL HYGIENE

F. G. PEDLEY, B.A., M.B., D.P.H., J. G. CUNNINGHAM, B.A., M.B., D.P.H.

INTERNATIONAL CONFERENCE ON SILICOSIS, JOHANNESBURG, SOUTH AFRICA

A. G. CUNNINGHAM, B.A., M.B., D.P.H.

THE subject was considered under three main headings, (1) prevention, pathology and diagnosis, (2) prognosis and compensation and after care.

Prevention

Measures for the control of dust have been mainly the use of water and of local exhaust equipment. Soap-suds, saturated steam, treacle and the addition of other dusts have been tried.

It was considered that substances that would favour the aggregation of small particles under 10 microns outside the body would decrease their inhalation. Some clays may do this but there is no evidence indicating that the presence of other dusts favours its elimination once silica reaches the lungs.

The use of water in connection with the control of dust in South African mines has been attended by earlier manifestations of tuberculosis. The tubercle bacillus has been isolated from mine water and from the air in mines. Having in mind the increased facility with which inhalation infection is produced when organisms are sprayed with water as compared with dry spraying, some doubt is raised as to the desirability of the use of unlimited quantities of water. Further, it is probable that the very fine silica particles are not carried down by water.

In mines, in addition to water, general ventilation is used to produce air change and to impinge small particles against the wet surfaces. For suitable processes, such as grinding, and stone cutting exhaust equipment which removes dust at its source is more effective than water. Unfortunately, such equipment is, very frequently, poorly designed and maintained.

Pathology

Two or three recent contributions to the pathology of the disease may be indicated. Dr L. U. Gardner, Saranac Lake, has produced silicosis in guinea pigs and rabbits, together with some experimental evidence to suggest that tubercle bacilli in the presence of silica in the lung are increased in number but not in virulence. Professor Kettle, Pathologist at St. Bartholomew's Hospital in London, has shown that the latent period of growth of the tubercle bacillus is reduced with the presence of silica in the media. Strachan and Simpson at the South African Institute of Medical Research in the study of cases of *status lymphaticus* in children, have shown the presence of aggregations of lymphoid tissue associated with the bronchial system and not with the blood vessel system as described by Miller. They suggest that these aggregations are present, though smaller, in the normal lung,

and determine the location of fibrotic nodulation in silicosis.

Diagnosis

The Conference recommended for general acceptance the classification of cases of silicosis developed and used by the Miners' Phthisis Medical Bureau in South Africa.

- (1) In the "First Stage" symptoms referable to the respiratory system may be either slight or even absent. Capacity for work may be slightly impaired. There may be a departure from the normal in percussion and in auscultatory signs, and the radiograph must show an increased density of linear shadows, and the presence of discrete shadows, indicative of nodulation.
- (2) In the "Second Stage", there is an increase of the physical signs observable in the 'First Stage', and the radiograph shows an increase in the number and size of the discrete shadows indicative of nodulation with a tendency to their confluence. There must be some degree of definite impairment of working capacity.
- (3) In the "Third Stage", all the above conditions are greatly accentuated and indications of areas of massive fibrosis are usual. There is a serious or total incapacitation.

The so-called ante-primary or "first" compensable stage, characterized by indications of generalized mottling in the X-ray, with a history of exposure to silica dust, and with or without other physical findings

including disability, presents at autopsy a lung containing on macroscopic examination fairly evenly distributed nodules which are visible and palpable.

The later stages are associated with an increase in size and number of these nodules, symptoms of cough and shortness of breath, and on physical examination, decreased chest expansion, altered breath sounds and disability.

There is no doubt, a presilicotic stage which cannot be distinguished from fibrosis due to other causes.

Prognosis

Prognosis in silicosis is unsatisfactory. South African experience indicates that the ante-primary case of silicosis has a life expectancy of thirteen years and that practically all cases ultimately progress, usually with the development of tuberculosis, to total disability.

Compensation

This is important from the standpoint of silicotics entering this country, since in the absence of other resources they are likely to become a public charge. It is important also as indicating the desirability for intensive investigation to determine whether there is a stage in the inhalation of silica dust in which men could be removed from exposure without the almost inevitable development of tuberculosis.

In South Africa it is now suggested that in many cases it is desirable to require removal from exposure, with the development of uncomplicated silicosis, partly because of the experience with the advent of tuberculosis in these cases which is favoured

by the reduction in income due to change in occupation.

A number of schemes for rehabili-
tating what appear to be uncomplicated cases of ante-primary silicosis have been developed in South Africa and Australia. They have

been mainly agricultural but under varying conditions, and all have failed. This is serious in countries where the opportunity for employment in other types of industry is distinctly limited.

NATIONAL VOLUNTARY HEALTH AGENCIES

ETHEL GREENWOOD, REG.N.

PRE-NATAL AND POST-NATAL LETTER SERVICE

AILEEN M. RIORDAN

THIS year the Child Hygiene Section of the Canadian Council on Child and Family Welfare, through its exhibit in the Voluntary Agencies' Section of the Ontario Provincial Department of Health at the Canadian National Exhibition, demonstrated the free distribution of its pre-natal and post-natal letters throughout Canada.

The exhibit had as its centre a post box from which coloured ribbons were run to the provincial capitals on a large map of the Dominion of Canada which formed the background of the exhibit. A legend on the map explained the use of the various coloured ribbons. Red showed that letters were supplied in quantities of one thousand or more, yellow in quantities of one hundred and less and green indicated some special provincial service. On either side of the map was a pillar containing four coloured transparencies. At the base of these and a little in the foreground could be seen two miniature houses,—one representing a country home and one

a city home. The transparencies pictured some of the principles which the letters teach, while the houses were intended to show some types of homes which they reach.

This pre-natal and post-natal letter service is carried on in close co-operation with the provincial departments of health and is financed by the Canadian Life Insurance Officers' Association. The pre-natal series consists of nine letters, which upon request are mailed, monthly, free of charge and in plain envelopes to any expectant mother in Canada. At the present time these letters are being revised and any suggestions as to how they can be improved will be gratefully received by the Secretary of the Child Hygiene Section. From the time of the inauguration of this pre-natal letter service in February, 1926, until October 31st, 1930, 54,834 sets have been sent out; 22,991 of these were in the English language, and 31,834 were in French.

During the first year of the service the bulk of these letters were requested by expectant mothers during

the seventh, eighth, and ninth months of pregnancy, while the records for October, 1930, show that ninety per cent of the requests were sent in before the end of the fifth month and not one during the eighth and the ninth months. Seventeen per cent were reported during the first month; twenty-one per cent during the second; nineteen per cent during the third; twenty per cent during the fourth; thirteen per cent during the fifth; nine per cent during the sixth; only one per cent during the seventh and none as late as the eighth and ninth months.

The post-natal series, which are illustrated, cover the first year of the baby's life, and specially emphasize habit training. With the first letter is sent a handsome cover, in which the mother may keep it and the subsequent letters which she will receive.

The service was inaugurated late in August, 1930, and since then four thousand sets have been sent out in response to requests received from provincial departments of health, public health organizations and Canadian mothers.

REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES IN CANADA*
BY PROVINCES—NOVEMBER, 1930

Diseases	P.E.I.	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Diphtheria...	8	55	42	240	459	73	27	11	20
Scarlet Fever...	5	87	88	547	621	91	60	34	110
Measles.....	—	3	74	285	105	38	57	2	42
Whooping Cough.....	—	21	—	294	370	43	65	24	228
German Measles.....	—	10	—	5	31	†	3	7	6
Mumps.....	—	1	—	228	595	93	15	9	64
Smallpox.....	—	—	—	1	62	—	4	1	3
Cerebrospinal Meningitis..	—	2	—	1	2	1	1	—	1
Anterior Poliomyelitis	—	4	1	3	80	5	2	5	5
Typhoid Fever	2	6	33	99	73	19	15	3	19

*Data furnished by the Dominion Bureau of Statistics, Ottawa.

†Not reportable.

NEWS AND COMMENTS

P. A. T. SNEATH, M.D., D.P.H.

New Provision for Dental Service for Children in Ontario

THE recent recommendations of a special committee appointed by the Provincial government include grants to municipalities and school boards that are concerned in the establishment of free dental service to children of the pre-school and school group. Before the application

of a municipality or school board may be considered, there must be adequate dental equipment for the anticipated service, a public health nurse and a qualified dental nurse, in the case of populations of over 20,000. Municipalities of less than 20,000 may be considered if arrangements have been made insuring the required facilities and equipment by a dentist within or adjacent to the municipality apply.

ing. The amount of the grant is fixed at a maximum of \$1,000 to any one municipality, but the proportion assigned varies with the population. Those having populations over 20,000 may receive $7\frac{1}{2}$ per cent of the total cost of the service, areas of 5,000-20,000 are eligible for 20 per cent, and 1,000-5,000 populations are eligible for 25 per cent of the cost of the service. Township municipalities, irrespective of population, may be allowed 25 per cent. Such areas may combine for the provision of dental service and will be allowed the same proportion of total costs, namely, 25 per cent.

Septic Sore Throat — Kirkland Lake, Ontario

THE epidemic of septic sore throat at Kirkland Lake which accounted for, according to press reports, about 400 cases with five deaths, came practically to an end when the sale of all unpasteurized milk was stopped. A few contact cases have developed in the past two weeks. Dr. W. J. Bell, Deputy Minister of Health, has issued a warning that, with living conditions as crowded as they are in Kirkland Lake, there is a great probability that more contact cases than usual will develop. The local dairies are again supplying their customers. While their own pasteurization equipment is being installed, they are sending the milk to North Bay for pasteurization. Investigation as to how the milk originally became infected is still proceeding.

Canadian National Committee for Mental Hygiene

THE annual meeting of The Canadian National Committee for Mental Hygiene was held at the Committee's headquarters, 111 St. George St., Toronto, November 20th to 22nd, with representatives from eight provinces in attendance. Presentation of reports of research committees operating in five different

university settings, and discussion of results presented were the principal features of the meeting. Committees on teacher training, nursing education, medical education, and social worker training were continued, and a new committee on hospital standards, under the chairmanship of Dr. C. M. Hincks, was appointed; to set up minimum standards for mental hospitals in accordance with Canadian conditions. A resolution was passed advocating the establishment of psychopathic wards in general hospitals of 500 or more beds.

The appointment of Dr. C. M. Hincks, since 1924, Medical Director of the Committee, as General Director of the National Committee for Mental Hygiene in the United States, to be effective January 1st, 1931, was announced. He will not sever his connection with the Canadian Committee, however, but will still retain the active direction with the title of General Director. Dr. A. Grant Fleming, Professor of Public Health and Preventive Medicine, McGill University, becomes Medical Director in succession to Dr. Hincks. He will still continue his duties at McGill, but will spend part of his time in Toronto attending to Committee affairs. Dr. C. B. Farrar, Professor of Psychiatry, University of Toronto, and Director of the Toronto Psychiatric Hospital, was appointed Associate Medical Director. H. B. Spaulding, Ph.D., was appointed Director of the Division of Statistics and Legislation.

At a public session held in Convocation Hall, the principal speaker was Dr. C. F. Martin, Dean of the Faculty of Medicine, McGill University, and President of the Committee. Other addresses were delivered by Dr. Fleming, Dr. A. H. Desloges, General Medical Director, Hospitals for the Insane, Province of Quebec, and Dr. J. M. MacEachran, Professor of Philosophy, University of Alberta. The Honorable Dr. J. M. Robb, Minister of Health, Province of Ontario, was in the chair.

British Columbia

WITH the appointment of Dr. J. W. McIntosh as Medical Health Officer for the City of Vancouver, Dr. William Sagar, formerly of Port Coquitlam, B.C., has been appointed his successor as Medical Health Officer for the municipality of Burnaby.

Saskatchewan

DR. O. E. ROTHWELL of Regina has been appointed by the Public Health Services Commission as director of psychopathic services in addition to his present part-time duties as gaol physician. In connection with this, the first psychopathic ward in Regina was opened early in December.

The Minister of Public Health, The Honourable Dr. F. D. Munroe, has announced that the first phase in the cancer programme in this province will be the opening of an emanation plant at the University of Saskatoon. The only other plant of this kind in Canada is at Montreal.

Manitoba

ON December 16th the Department of Health and Public Welfare commenced a series of radio talks over the Manitoba government telephone station, C.K.Y. These talks are being put on twice a week—on Tuesdays and Fridays at one o'clock and last for ten minutes.

Altogether a series of fifty talks on various phases of public health have been arranged for. The Honourable Doctor E. W. Montgomery, Minister of Health and Public Welfare gave the opening address. All the directors of the different divisions of the Department of Health and Public Welfare will contribute to this programme, and it is the hope that each paper presented will contain some information which some section of our population will find of value.

In August last a new unit of one hundred and sixty beds was opened at Selkirk hospital for mental diseases, Selkirk, Manitoba. This new unit is for chronic patients who require continued care. The beds are equally divided between the two sexes. The opening of this unit has materially lessened the overcrowding in this institution.

The first Manitoba Conference on Social Work was held in the Marlborough Hotel, Winnipeg, on October 7th, 8th and 9th, with a large and representative attendance, and was undeniably successful when viewed from the point of view of attendance, interest shown in discussion, and calibre of papers and addresses given. The chief topics of discussion were: "Family and Child Welfare," "Delinquency, its Cause and Treatment," "Mental Deficiency," and "Public Health."

The Honourable E. W. Montgomery, Minister of Health and Public Welfare, welcomed the delegates in a very fitting address.

Among the papers of special interest to physicians were those of Doctor F. W. Jackson on "Recent Advances in Preventive Medicine"; Doctor D. A. Stewart, of Ninette, on "Social Ramifications of Tuberculosis"; Doctor McGhie on "Mental Deficiency" and "Mental Health Clinics".

At this conference Dr. E. S. Moorhead, Chairman of the Board of Welfare Supervision of the Department of Health on Public Welfare for the province presented a most interesting survey of the possibilities of Health Insurance in Manitoba. It was his opinion that a provincial contributory scheme of health insurance was not feasible. While it might be applied to the cities, it was too expensive for the average country district of the province and that in so far as the unorganized districts were concerned they would be unable to contribute at all but would require a subsidy.

Ontario

THE Honourable Dr. J. M. Robb, Minister of Health, Ontario, recently addressed the Annual Meeting of the Halton County Educational Association advocating the formation of a full-time health unit for Halton County. He contrasted the amount paid for education with the amount expended in public health. In Halton County the figures per capita for 1929 were \$9.11 and 13c. respectively. The estimated cost of the maintenance of a health unit for a population of 2,500 with an adequate staff was \$18,000.

At this meeting Dr. R. K. Anderson, M.P., assured the gathering that provision would be made by the forthcoming session of the Dominion House for financial assistance in the development of full-time health units in Canada.

The Community Health Association of Greater Toronto announces that a course of demonstrations and lectures for the benefit of its member units. Arrangements have been almost completed whereby the Victorian Order of Nurses for Canada will sponsor an institute to be conducted in the early spring with a view to promoting among responsible workers a better understanding of maternal care.

The Child Welfare Council of Toronto, representing sixty-three agencies, serving the interests of childhood within the city, has set itself a new, quite unique task of calling upon the taxpayer and those in responsible positions in municipal affairs to revise radically the allocation of the total municipal dollar. In other words, the Council feels that the time is ripe for the awakening of a public conviction that pro-

portionately all too little of the taxpayers' money is spent on municipal health and welfare programmes.

Quebec

THE Board of Health of the city of Montreal on behalf of the city have recently completed negotiations with the Notre Dame Hospital for the care of contagious diseases. The Notre Dame Hospital is to undertake the reconstruction and maintenance of a 300-bed institution on the site of the present smallpox hospital. The city will pay at the rate of \$3.30 per diem for each bed over a period of 25 years and will guarantee such debt as is incurred by the structural alterations. If at the end of the 25-year contract the hospital has managed to operate without any deficit, the site becomes the property of the hospital authorities. Failing this, the civic authorities retain the site and become owners of the hospital buildings.

About fifteen months ago the Provincial authorities ordered the municipality of Quebec to effect an adequate purification scheme for the local water supply. Considerable opposition on the part of the electors of the municipality has arisen over meeting this order by a system of chlorination. The City Council referred the subject to the Medical Society of Quebec which by a considerable majority approved of chlorination.

Prince Edward Island

A FULL-TIME health service for the province of Prince Edward Island is to be put into operation on July 1st, 1931. This service is to be under the direction of the Provincial Board of Health, and will include six nurses, two sanitary inspectors, three clerks, and laboratory facilities.

BOOK REVIEWS

D. T. FRASER, B.A., M.B., D.P.H.; R. R. McCLENAHAN, B.A., M.B., D.P.H.

Laboratory Medicine. *By Daniel Nicholson, Assistant Professor, University of Manitoba, Assistant Pathologist, Winnipeg General Hospital. Lea and Febiger, Philadelphia, 1930. 433 pages with 108 illustrations and a coloured plate. Price \$6.00.*

This book is a laboratory guide for practitioners and students of medicine. In it are detailed the principles and the author's interpretation of laboratory methods and diagnostic procedures which have been found to be of value in the actual practice of medicine. The general scope of the work will be indicated by a categorical statement of its contents, namely, important normal standards; indications for laboratory tests in all cases; choice of tests in inflammatory diseases; procedure for examination in anaemia; choice of tests to determine the cause of abnormal haemorrhage. Then follow indications for blood chemical tests, tests of gastric function, liver function, renal function, investigation of urethral infections, pus discharges, etc.

Following this statement of procedures and choice of tests the ensuing ten chapters are devoted to detailed outlines of methods of laboratory examination of blood, blood chemical tests, biological reactions of the blood, examination of exudates, puncture fluids, sputum, cerebro-spinal fluid, gastric and duodenal contents, urine and feces. Subsequent chapters are devoted to consideration of cutaneous tests, reactions of immunity and miscellaneous examina-

tions. Finally, a carefully compiled list of laboratory equipment including apparatus, reagents, stains, etc., for a large or small laboratory is set out.

Careful scrutiny of the book reveals the fact that very few procedures with which practitioners should be familiar have been omitted. On the contrary, methods which have only very recently found their way into medical literature are described in this volume. An illustration of this is the inclusion of the Ascheim-Zondek test for pregnancy. The reviewer has, however, failed to find reference to the Sabin rapid method of typing pneumococci, the value and utility of which is well established. In general, the merits of this volume are such that they more than outweigh some minor points to which criticism might be directed. The wisdom of including therapeutic hints in a volume of this sort is probably open to question, in principle. After all, a book on laboratory medicine really has served its purpose when it has outlined methods of established value which may be carried out in the laboratory to obtain information to supplement that which is secured by clinical examination of the patient. Only when all the evidence so obtained is assembled and correlated are therapeutic measures indicated or in order. The physician makes the diagnosis and treats the patient.

In conclusion, this reviewer desires to congratulate the author of *Laboratory Medicine* upon the production of a book of which Canadian Medicine

may well be proud and one which can be strongly recommended to medical students and practitioners alike.

J. G. F.

Nervous Indigestion. By *Walter C. Alvarez, M.D., Associate Professor of Medicine, University of Minnesota (the Mayo Foundation)* 297 pages. Price \$3.75. *Paul B. Hoeber, Inc., New York.* 1930.

This book is written to instruct young graduates in digestive disturbances of nervous, psychical or functional origin. The author's attitude toward demonstration of advanced cases of disease recalls Sir James Mackenzie's assertion that the easiest cases to diagnose are those found in hospital wards, under the care of senior physicians, while the most difficult present themselves at outpatient departments where junior physicians are in attendance.

In chapter I, illustrative examples are given of the ways in which emotion can affect the gastro-intestinal tract—a subject elucidated by the experimental researches of Pavlov

and Babkin. Chapter II before treating of functional dyspepsia, describes briefly the common organic diseases causing indigestion cholecystitis being regarded now as the commonest organic disease of the digestive tract. Many colloquial and humorous expressions are used and the book is so easily read that "he who runs may read". Emphasis is laid in chapter III on the points to be attended to in history-taking and useful hints are given from the author's experience. The clinical entity of the nervous breakdown is admirably described and the sympathetic handling of the hysterical patient inculcated. The directions given for dietetic treatment are simple, concise and based on laboratory investigations. The advantages of a smooth diet, rest, and appropriate sedatives are commended while the injudicious use of coarse foods is disapproved. The book may be confidently recommended for it treats a difficult subject with humour, lucidity and common-sense derived from long experience in clinical and experimental work.

J.W.

BOOKS RECEIVED

A Bibliography of Social Surveys—Reports of Fact-Finding Studies Made as a Basis for Social Action; Arranged by Subjects and Localities. Reports to January 1, 1928. By Allen Eaton, Department of Surveys and Exhibitions, in Collaboration with Shelby M. Harrison, Director, Department of Surveys and Exhibits, Russell Sage Foundation. Price \$3.50. Published by Russell Sage Foundation, 1930, New York. pp. 467.

Seventy Birth Control Clinics.—A Survey and Analysis Including the General Effects of Control on Size and Quality of Population. By Caroline Hadley Robinson, foreword by Robert Latou Dickinson. Published by The Williams & Wilkins Company, 1930, Baltimore, Md. pp. 351.

Annual Report of the Department of Health, Montreal, 1929—Dr. S. Boucher, D.P.H., Director.

CURRENT HEALTH LITERATURE

These brief abstracts are intended to direct attention to some articles in various journals which have been published during the preceding month. The Secretary of the Editorial Board is pleased to mail any of the journals referred to so that the abstracted article may be read in its entirety. No charge is made for this service. Prompt return (within three days) is requested in order that the journals may be available to other readers.

Success in Health Work—

Presidential address, American Public Health Association,—an excellent survey of public health, national and international, and the part played by the Association.

CHESLEY, A. J. Am. J. Pub. Health, vol. XX, No. 12 (Dec.), pp. 1275-1286.

Agglutination Tests in Undulant Fever—Report of a co-operative investigation by the New York State Association of Public Health Laboratories. Of the 3,716 routine samples of sera 1.72 per cent were positive (dilution greater than 1:100); some degree of agglutination in 4.4 per cent. Technique is given fully.

BAYNE-JONES, S. Am. J. Pub. Health, vol. XX, No. 12 (Dec.), pp. 1313-1322.

Convalescent Serum Clinic—Conducted by the Detroit Department of Health and opened in January, 1928. Large quantities of sera have been collected from donors convalescent from scarlet fever, measles, whooping cough, chickenpox, poliomyelitis, mumps, influenza and meningococcic meningitis. Technique is outlined.

VAUGHAN, H. F. Am. J. Pub. Health, vol. XX, No. 12 (Dec.), pp. 1343-1356.

Pregnancy and Tuberculosis—484 married women who had "graduated" from Trudeau Sanatorium, Saranac Lake, N.Y., answered in detail a questionnaire regarding their experiences with child-bearing, making possible certain valuable comparisons and observations.

MATTHEWS, H. B., BRYANT, L. S. J.A.M.A., v. 95, No. 23, pp. 1707-1714.

Arterial Hypertension in Industry—Hypertension in industrial employees over 54 years of age and the advice to give employers.

WYCHGEL, J. T. J. Indust. Hyg., v. XII, No. 9 (Nov.), pp. 319-323.

Incidence of Illness Among Wage Earning Adults—Fifth in the series of "Studies in the Diseases of Adult Life"; Milbank Memorial Fund—a most important contribution to our knowledge of morbidity.

BRUNDAGE, D. K. J. Indust. Hyg., v. XXII, No. 12 (Dec.), pp. 618-622.

Prechlorination and Water Filtration—Used as an auxiliary method for reinforcing over-burdened plants and as a possible means of effecting economies in the use of coagulants. Endorses the first use and points out possible disadvantages.

STREETER, H. W., and WRIGHT, C. T. Pub. Health Rep., v. 45, No. 51, pp. 3105-3128.

Relation of the Nurse to Maternal, Infant and Pre-School Health—Suggestions as to practical measures for bettering conditions to-day.

BOLT, R. A. Pub. Health Nurse, v. XXII, No. 12 (Dec.), pp.

Considerations au Sujet de la Vaccination Antidiphtherique—The author believes that mortality from diphtheria will only be further lowered by active immunization. He recommends that all children 2 to 7 years of age be vaccinated with toxoid (anatoxine) and that older chil-

dren and adults, if Schick positive, be likewise vaccinated.

MOREELS, DOCTEUR G. *Revue Belge des Sciences Médicales*, v. II, No. 8, pp. 710-717.

Requirements in a State Program for the Care of the Mentally Deficient—A presidential address stressing the need for and advantages of a uniform program applicable to every state.

WALLACE, G. L. *Mental Health*, v. XIV, No. 4 (Oct.), pp. 907-918.

Methods and Aims of Popular Health Education in Germany—

The program of the Reich Committee on Popular Health Education.—introduction of health lessons into school programmes which teaching is given by the school teachers; provision for training of teachers in hygiene; value of evening entertainments organized by the children and attended by their families; co-operation of the press and publication of popular booklets, posters, etc.; use of broadcasting and cinema. Observations based on the International Health Exhibition at Dresden which was held during 1930.

ADAM. *The World's Health*, v. XI, No. 4 (Oct.-Dec.), pp. 358-365.

Prevalence of Mental Disease Among Jews—Many students of the problem have considered that Jews show an excessive frequency of mental disorders but others have maintained that Jews have less than their quota. A study of the experience of New York State for the period 1914 to 1929 inclusive indicates that Jews have lower rates of first admission to hospitals for mental disease than non-Jews and that the impression that the prevalence of mental disease is greater is not founded on fact.

MATZBERG, BENJAMIN. *Mental Hygiene*, v. XIV, No. 4, (Oct.), pp. 926-946.

Copies of any of the journals referred to in these abstracts will be sent by the Secretary of the Editorial Board to permit of the reading of the abstracted article in its entirety. No charge is made for this service. Prompt return, within three days, is requested.

Neutralization of Poliomyelitis Virus by Human Serum—Pooled serum from 3 convalescents, serum from 49 different persons (14 poliomyelitis convalescents, 7 familial contacts, 10 normal adults, 10 normal children—4 of whom were rural residents, and 5 normal infants) were tested using macacus rhesus monkeys. The conclusion is drawn that the serums of the normal adults used possessed power to neutralize virus in vitro equal to or greater than the serum from the convalescents tested.

SHAUGHNESSY, H. J., HARMEN, P. H. and GORDON, F. B. J. *Prev. Med.*, v. IV (Nov.), No. 6, pp. 463-475.

Silicosis—Directs attention to a disease which is likely to assume increasing importance in Canada as an industrial hazard and discusses its pathogenesis.

BELT, J. H. *Canad. M.A.J.*, v. XXIII, No. 6 (Dec.), pp. 802-804.

A Study of Bacterium Dysenteriae, Sonne Type—The Sonne dysentery bacilli appear to constitute a distinct type. Found in many localities in association with dysentery or dysentery-like conditions, particularly of infants.

KOSER, S. A., REITER, D. O., BORTNIKER, E. and SWINGLE, E. L. J. *Prev. Med.*, v. IV, No. 6, (Nov.), pp. 477-501.

Special Feeding Methods for Infants—“Good infant feeding should be the province of every practitioner rather than the realm of the pediatrician and when the truth of the utter simplicity of infant feeding is finally brought home to every physician, special methods except in rare and special instances will no longer exist”—an excellent summary of such special methods.

GOLDBLOOM, A. *Canad. M.A.J.*, v. XXIII, No. 6 (Dec.), pp. 807-810.

